



Bulletin



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COMMENT

NINETY YEARS OF NATURAL HISTORY

On 25 March 1909, a small group of naturalists gathered at the house of the Lieutenant Governor of East Africa, Frederick Jackson. Their objective: to create a Society that would promote interest in, and knowledge of, the remarkable flora and fauna of eastern Africa. Thus was born the East Africa and Uganda Natural History Society. Its initial aims were to start a natural history museum and publish a scientific journal, and both of these were achieved by the end of 1910.

Still going strong ninety years later, the EANHS (the 'Uganda' having been dropped along the way) is Africa's oldest scientific Society. The museum it founded in Nairobi eventually grew into the National Museums of Kenya, an organisation whose scope is unparalleled in the region. The two organisations are still umbilically linked.

The initial membership reads like a 'who's who' of East African science and society in the early years of the century. The first Chairman, Frederick (later Sir Frederick) Jackson, was both a colonial administrator and renowned ornithologist (Jackson's Francolin and Jackson's Widowbird bear his name). The first Honorary Treasurer was the geologist C.W. Hobley, of Hobley's Volcano fame. T.J. Anderson, the Chief Entomologist in the Agricultural Department, took on the onerous rôle of Honorary Curator. A plot on Sixth (now Kenyatta) Avenue was identified as the site for the new museum, which was ready for occupation on 16 August 1910 at the monthly rent of two pounds and ten shillings. The embryonic Nairobi Museum was a room some ten by eight metres, which soon became crowded with specimens of all kinds sent in by members. Plants, fish, birds, mammals and molluscs arrived in quantities, not to mention a complete elephant skull donated by Mr H.B. Dunham.

Membership of the Society continued to grow steadily, but the organisation was not without its problems. The Minutes of those early years make fascinating reading, not least because the kinds of difficulties that bedevilled Committees then have changed very little over the years. Shortage of space, shortage of money, shortage of time among

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the honorary office-bearers, delays in publication of the *Journal*—these were all issues of concern back in 1911 as much as today. If the Society flourished, it was because of the commitment of its members, and the generosity of those who contributed to meet its expenses and allow it to expand.

The Society took a significant step in 1921 with the construction of its own permanent museum on Kirk Road (opposite the present All Saint's Cathedral). This was formally opened in February 1922 by the Governor, Sir Edward Northey. Unfortunately, more tangible government and municipal support was not forthcoming, no curator could be employed, and the collections suffered despite the best efforts of several Honorary Curators. Matters improved somewhat in 1924. The Governor, Sir Robert Coryndon, took a personal interest in the Society's affairs and helped to secure a grant of £150 from the Colonial Office. This, with some successful fund-raising through an appeal, allowed the remaining debt for the museum building to be paid off.

When Sir Robert died unexpectedly in December 1924, it was decided to take up a public subscription to establish a memorial to him. This would take the form of an extension to the museum to be called the Coryndon Hall.

Despite the perennial shortage of funds, the Society and its members were doing valuable work. In the *Journal* were appearing the first 'handbooks' to East African birds and butterflies, by V.G.L. van Someren and the Rev. Canon K. St Aubyn respectively. The collections were building up quickly and numerous exchanges had been established for the *Journal*, forming the nucleus of an excellent natural history library.

However, disaster struck in 1926. The Government decided to realign Kirk Road, and the museum—just four years old—would have to be demolished. There began a long process of negotiation between the EANHS and the authorities. The final outcome was that the Society agreed to move its collections to buildings that would be built on a new plot on Ainsworth Hill (now Museum Hill). These buildings would include the Coryndon Memorial building, which the Society would

run as a museum accessible to the public, and laboratories and study rooms to be built by the Society. Rather less-than-lavish compensation of £2,500 was paid by Government for the existing museum. Almost half of this was immediately voted to the Coryndon Fund. The remainder was used to build the study rooms and laboratories behind the new Coryndon Memorial building.

The Coryndon Memorial, which forms the centrepiece of today's Nairobi Museum, was completed in September 1929, and the Society's collections were transferred there soon after. The expansion in space and facilities led to a flowering of activity. The ethnological section received valuable materials from Sir Frederick Jackson's collection, while stone age culture was represented by material collected by Louis Leakey. Plants were not neglected, with the public-spirited Ernest Carr (of Carr's Biscuits) donating funds to employ a botanist for three years. Insects of economic importance, fish, amphibians, reptiles, birds and timber were all on display. A full-time librarian was also engaged to take care of the rapidly growing collection of books and journals.

Running this growing museum required a body of professional staff, but the Society still did not have the resources to employ enough people. Despite the popularity of the museum (more than 2,000 visitors were recorded in 1931), entrance fees did not even come close to providing enough income. Despite constant pleas from the Society, Government still seemed indifferent to the need for a properly equipped and staffed museum that would promote research and public education. Assistance was forthcoming only in the most minimal and grudging way. Indeed, the Government's financial committee felt that the Society was spending extravagantly, a view that amazed those actually involved in the museum's administration. So the Society was left to scratch around for such other support as it could muster. Constant cuts in salary and laying-off of staff were no way to develop an institution, and curators inevitably suffered as a result. Once again, only the dedicated efforts of the Society's members and its long-suffering employees allowed any progress to be made. At least visitor numbers were still growing: a total of 5,099 visitors (of

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all races—the Society had been firmly multi-racial since its inception) was recorded in 1936.

Matters came to a head in 1937 with the commissioning of an official Committee of Inquiry 'into the relationship between the Coryndon Memorial Trustees and the East Africa and Uganda Natural History Society, and into the conditions under which the Coryndon Memorial is maintained'. Evidence was taken during June and the report published soon after. After paying glowing tribute to the Society's efforts thus far, the report made practical suggestions for the future. In essence, the EANHS would hand over both its collections and the museum to a Board of Trustees, on which the Society would be represented.

The report was discussed during a Special General Meeting of the Society that October. It was clear that the museum had been nurtured to a stage where economic factors made it necessary for the state to step in. The Society was asked to continue managing the museum (this time with some external Government support) until January 1939, to give time for the appointment of a Board of Trustees under the new ordinance. The Society's constitution was amended accordingly, and all museum assets, other than the library, were handed over in return for an annual payment of £100 for 15 years. This was an almost nominal sum, only a tenth of the estimated value of the assets, but the Society assented willingly enough so as to give the new trustees the best possible start. The EANHS, for its part, retained free access to the museum, laboratories and collections, space to house its library and continue its meetings and other activities, and the right to nominate two members to the Board of Trustees (such members to represent 'scientific interest'). Dr V.G.L. van Someren, Vice-President and a major contributor to developing the Society and its museum, became the first Museum Director (though he was to resign soon after, in 1941).

The war years were difficult ones for the EANHS: trying to keep activities and publications going was challenging in the circumstances, especially with chronic shortages of paper and petrol. Nonetheless, membership continued to grow in fits and starts, the Journal continued to appear and publish interesting articles, and the Museum itself flourished steadily—89,000 people visited during 1945.

The last 50 years have seen many ups and down. However, the Society survived and, finally free of the administrative burden of running the Museum, has continued to broaden its activities. Through the Journal, the Bulletin and other publications, much knowledge about East Africa's fauna and flora was gradually put on record. Landmark publications such as *Birds of East Africa*, *Breeding Seasons of East African Birds* and *Upland Kenya Wild Flowers* (2nd edn.), standard bird and mammal checklists, as well as monographs on (among others) cowries, butterflies, snakes, succulent plants, sedges, orchids and freshwater prawns, all summarised quantities of technical information for a wide audience. Society members were involved in numerous and diverse biological projects, some lasting many years and involving extensive co-ordination. These included

collecting data on Black-headed Herons nesting in Nairobi, censusing mammals and surveying plants in Nairobi National Park, rescuing flamingo chicks at Lake Magadi, botanical mapping on the Ngong Hills, ringing migrant birds at Ngulia and elsewhere, collecting nest record card data, counting birds at a variety of sites, and a whole range of biodiversity surveys.

The Society had always been in the forefront of the conservation movement, pressing in particular for the designation of national parks (both terrestrial and marine). In the last decade, the need to conserve biodiversity, and not just study it, has become ever clearer and more urgent. The Society's programme now has a strong focus on conservation action. Growing out of its participatory traditions, there is a special emphasis on educating and involving young people and people living around key conservation sites. The EANHS, or Nature Kenya and Nature Uganda as it is now known in Kenya and Uganda respectively, is also shaking off its image as a slightly dusty (albeit worthy) organisation, and moving into its tenth decade with renewed vigour. As Nature Kenya celebrates its 90th birthday, what better time to encourage others to join?

Acknowledgement. This very brief history draws extensively on the more detailed account by the late Mrs E. Angwin, published in six parts in the EANHS Bulletin of 1979.

Leon Bennun
Chairman, EANHS

ARTICLES

KENYA'S LATEST SNAIL DISCOVERY.

The East African region (Kenya, Uganda and Tanzania) is very rich in terrestrial molluscs with over 1,063 documented species (Verdecourt, 1983) and many more which are undescribed (Tattersfield, 1998). In comparison, there are only 279 species present in northwest Europe (Kerney & Cameron, 1979) which has a larger land area. East Africa is also a notable mollusc centre of endemism (Emberton *et al.*, 1997).

The regional mega-mollusc diversity is concentrated essentially within the tropical rain forests, for instance Kakamega forest in western Kenya (Tattersfield, 1996), and highland forests (Verdecourt, 1983). The greatest endemism occurs in the Indian Ocean coastal forest and the Eastern Arc mountains (Emberton *et al.*, 1997; Tattersfield, 1998), notably, the Usambaras, Pugu in Tanzania and Taita hills in Kenya among others. These mollusc hot spots and centres of endemism cover only 2–3% of the region's land area (Sayer *et al.*, 1992) and are under intense pressure following human population explosion in recent times.

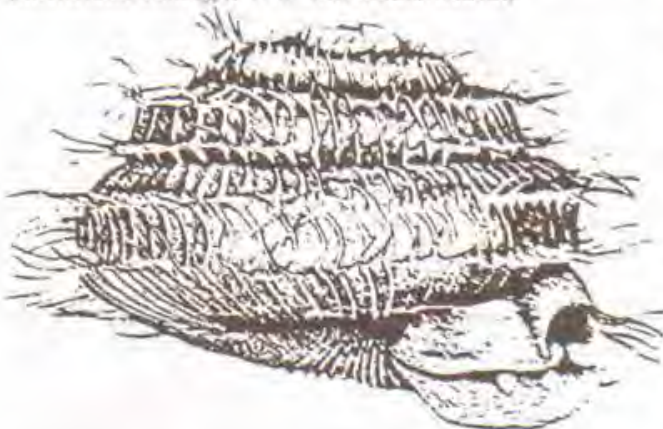
Despite the high regional malacofauna diversity and

endemism, many forests remain under-sampled implying that there are probably numerous undiscovered snails in East Africa. This was confirmed with the discovery of *Gulella spinosa* in recent times. This fascinating, small sized, spiny snail became known to science in late 1996 after being collected at the western slopes of Mt. Kilimanjaro at altitude 1,310 m above sea level (Kifufu, Moshi, 30°9'30" S, 37°4'25" E) and described in 1998 (Tattersfield, 1998). Since then, *Gulella spinosa* was globally known to be only restricted within Mt. Kilimanjaro forests. A combined force of malacologists from the National Museums of Kenya, National Museum of Wales and National Museum of Tanzania went to the area in June 1997, but failed to record the species using direct search method (Emberton *et al.*, 1997).

However in August 1998, during a field exploration survey, I scooped several specimens of the species from the forest floor litter of the Taita Hills forests using the same direct search technique. A puzzling observation Taita hills (03°20' S, 38°15' E) is the north most range of the Eastern Arc mountains with altitude over 2,200 m at the hill peaks (Brooks *et al.*, 1998). The natural forests here have in recent times been heavily exploited (*op cit.*) and to date only a few disturbed forest fragments survive on the hill peaks. *Gulella spinosa* in Taita hills was recorded from four fragments, namely Mbololo, Ngangao, Fururu and Yale forest.

Discovery of *Gulella spinosa* in Taita hills was an enrichment to the documented Taita and Kenyan terrestrial molluscs checklist. It is also a development in the understanding of the biogeographical range extensions of the species. But more important, in future, is fostering understanding of the ecology and distribution of the species, including its population size. Such information is crucial in understanding the conservation status of *Gulella spinosa* and subsequently setting conservation strategies for the species along with the entire ecosystem, if proved necessary.

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A specimen of *Gulella spinosa* (Tattersfield, 1998).

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THE PROPOSED NGURUMAN PROJECT: USE OF RAPTORS AS TOOLS FOR CONSERVATION AND ECOLOGICAL MONITORING OF BIOLOGICAL DIVERSITY

Why raptors?

Raptors can be an important tool to focus conservation strategy locally, regionally and globally (Watson 1991). They can be used as "umbrella species" because their large home ranges and low nesting density suggest that any protected area encompassing a viable population of raptors, or a complete community of them, would protect sufficient habitat and populations of most, if not all, other species in the food web below them (Thiollay 1992). Raptors also occupy top positions in terrestrial and aquatic food webs and therefore can be used as indicators of world-wide pollution by pesticides (Newton 1979). Changes in raptor distribution or abundance can serve as measure of man's impact on landscapes, even in remote areas (Reichholf 1974). Finally, raptors are

popular, charismatic organisms representing our natural world, and several have become significant "flagships" for arousing public interest and support of wider conservation programs (Burnham *et al.*, 1992, Thiollay 1992).

The Ngurumans

The Nguruman area (1°50'S, 36°05'E) is about three hours by road southwest of Nairobi. Climatically, the area is hot and dry (monthly mean maximum temperatures ranging from about 32-39°C (Brightwell *et al.*, 1992) with rainfall averaging about 525 mm per year (Brightwell *et al.*, 1997). The Nguruman area and the immediate surroundings (Lake Magadi, Lake Natron and the Loita Hills) are renowned for their avifauna, and in particular, their rich raptor community. A staggering 42% of the raptors that breed in the east African tropics, occur in the Ngurumans. Almost 40% of breeding raptors in East Africa have been listed as either Vulnerable, Threatened or Near-Threatened in the preliminary Red Data List of East African birds in jeopardy (Bennun and Njoroge, 1996) and therefore provide the impetus for conducting immediate raptor studies in a potentially threatened area (see threats below). Furthermore, three Globally-threatened bird species (Grey-crested Helmer Shrike, Red-throated Titi and Jackson's Widowbird), four Regionally-threatened species (Bearded Vulture, African Crowned Eagle, Purple-throated Cuckoo-shrike and Striped Flufftail) and one Restricted-range species (Hunter's Cisticola) occur in the Nguruman area (Bennun and Njoroge, *in prep.*) By virtue of its closeness to Nairobi, its rich (but poorly studied) fauna, and diversity of habitats, the Nguruman area provides ample opportunity for biological research aimed at providing effective conservation and management guidelines for its preservation.

The universal problem of rapidly changing land-use patterns, without a coherent plan for conserving biological resources, threatens to destroy the future of the Nguruman area. The market in northern Europe for exotic vegetables is the impetus behind the growth of export-crop farming in Kenya. As a result, there are plans to increase the present 500 acres under horticultural development to 5000 acres using irrigation (gravity and pump-driven) water taken from the Entasopia and Oloibonoto rivers originating above the Nguruman escarpment and from the Ewaso Ng'iro river in the plains below. The growth and expansion of export vegetables has been at the expense of local subsistence crops such as maize and beans (last year, maize and beans had to be imported to sustain local communities) (Sithanathan, pers. comm.). Indiscriminate use of pesticides and fertilisers to maximise crop production is on the increase and has been estimated at proportions four to eight times the recommended levels of use. This could have far-reaching negative effects on the livestock of the local pastoral communities who comprise the majority in the area, not to mention the impacts of

contamination on biodiversity. The local communities also depend on water from the escarpment rivers and the Ewaso Ng'iro for consumption. Already, there is evidence of salinisation of farmland, primarily due to fertiliser inputs. Additionally, social disharmony among farmers has recently been reported, as a result of competition for access to rationed water. The growth of export farming also strains the group ranch social structure by increasing the demand for subdivision and privatisation of what are mostly at present, communally owned grazing lands. Finally, and perhaps most importantly, the expected increase in horticultural acreage along the Ewaso Ng'iro River poses a potential threat to the health of Lake Natron, the major breeding site for flamingos in Africa and a world heritage site.

What can be done?

At a recent meeting convened by ICIPE at their headquarters in Kasarani, several institutions concerned with issues of conservation, community development, and sustainable land management were invited to participate in a workshop aimed at providing beneficial alternatives to vegetable export farming as well as to formulate suitable guidelines for the conservation of the area. The response was overwhelming and the general consensus was to implement a multi-disciplinary or integrated approach towards better understanding the ecology of the area. Without a thorough understanding of the ecological factors affecting the dynamics of an ecosystem, conservation management cannot be properly focused. We are all only too familiar with the ecological problems that affected Lake Naivasha. The Nguruman area is unique and we as conservationists must do all we can to promote sustainable use of biological resources. At the ICIPE meeting, the following objectives were proposed as part of an overall multi-disciplinary strategy to monitor changes affected by changing land-uses as well as to gather vital biological information which will be used to effectively conserve and manage the Nguruman area:

- use of aquatic invertebrate biodiversity measurements (Resh and Jackson 1993, Chutter 1994) to assess water quality of streams immediately upstream and downstream of irrigation sites;
- evaluate the effects of pump irrigation farming on water quality of the Ewaso Ng'iro River and estimate the buffering capacity of the Ewaso Ng'iro swamp, upstream from Lake Natron;
- characterise land quality and soil arthropod diversity on cash crop farms by comparing appropriate edaphic indicator variables in horticultural farms, mixed horticulture/orchard farming and adjacent non-farm sites;
- evaluate orchard farming (e.g. mangoes) as an economically viable alternative to high turnover insecticide and fertiliser intensive farming;
- evaluate the role of bees in providing pollination services and their cascading effects on the ecology of the area;

- carry out a small mammal study to investigate species diversity, negative health impacts and causes of fluctuations. This study will run concurrently with a study on raptors to investigate the classical predator-prey cycle syndrome which affects productivity and diversity of many species of raptors. Other correlates such as rainfall, temperature, land-uses and impacts of grazing pressure will be incorporated.
- evaluate raptor species diversity and density, autecological studies on a "flagship species" such as the Eastern Pale Chantrel Goshawk—looking at impacts of different land-use systems (as well as changing land-uses) on its ecology and behaviour, raptor banding program to study replacement rates, pesticide survey (based on blood and muscle tissue collected from raptors), and nest-searches and monitoring.

The role of raptors in conserving the Nguruman area

The Nguruman Project promises to be a highly focused yet multi-faceted conservation approach which employs raptors in an umbrella of protection and as instruments for understanding the environment. The approach is rooted in partnerships with local organizations such as ICIPE, National Museums of Kenya, African Centre for Conservation, and the East Africa Natural History Society among others, with the stated goals of: a) conserving biological diversity; b) building local capacity for conservation; and c) answering significant scientific questions which will aid in providing conservation and management recommendations for sustainable use of the area. Research activities in the area will fall into two categories: 1) single species studies, conducted in such a way that community-level questions can ultimately be addressed, and 2) baseline inventory and monitoring efforts.

Training and education

The Nguruman Project proposes to use the process of conducting research as a vehicle for training and education. Local people with limited formal education but with considerable experience in the area will be trained in techniques for studying and monitoring woodlands, forests and bird communities, while they participate in data collection, and, in some cases, project design, data analysis and interpretation. This method has already proven successful in other areas such as Arabuko-Sokoke forest (David Ngala) and Lake Naivasha (Reuben Chege) where locally trained individuals are collecting vital data for long-term monitoring projects. Collaborating organisations receive the benefit not only of more experienced staff, but community education, awareness, sensitivity and outreach.

Species-level studies

Species-level studies will focus on population dynamics

and ecological requirements such as prey preference, home range area, and population density of selected raptor species. Single-species studies are both short-term (two to five years) and long-term (more than five years). These studies provide the detailed biological knowledge that is needed for future management efforts and aids in interpreting data from censusing and monitoring. About 60% of the raptors that breed in the East African tropics are poorly understood in aspects of population dynamics, distribution, breeding biology and feeding ecology (Virani and Watson, *in press*). Hence much of what we learn will be new and exciting to the scientific world. Information from telemetry studies of density and home range provides estimates of habitat area required for sustainable populations and hence aids in designing sizes for reserves. A key feature of the single-species studies is that they are accomplished with sufficient standardisation of method so that they can eventually be combined to yield a community-level approach (Burnham *et al.*, 1992).

Inventory and monitoring

An important goal of the project is to establish a long-term ecological monitoring programme within the Nguruman area. This part of the project proposes to use repeated censusing of permanent 1 km² plots and of certain species groups to reveal possible ecological changes over time and to provide baseline comparisons between communities in different natural and modified habitats.

Habitats which will be compared are various primary forest and woodland types along a topographic moisture and drainage gradient, as well as areas subjected to various human uses: indiscriminate logging of figs and other trees, large and small scale farms, foliage for livestock forage, and conversion of riverine forest to a mosaic of successional stages by slash and burn agriculture. This segment of the proposed project includes refinement and comparison of census techniques described by Turley (1989) and evaluated by Whitacre and Turley (1990). While censusing efforts centre around raptors, several other bird groups and some mammals have been progressively incorporated into census protocols: tinamous, cracids, doves, psittacines, large woodpeckers, certain passerines, and primates. Our goal is to include species that are readily detected and identified and are likely to provide useful conservation information. For example parrots are subject to direct human exploitation, while hornbills and large woodpeckers may well prove sensitive to logging pressure.

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CONSERVATION OF KENYA'S MOST RARE AND UNIQUE GALLERY FOREST

While entering into the Tana River Gallery Forest, one cannot help but notice what a beauty and a different environment exists from the adjacent areas. One minute you are in a very dry bushland and in the next a cool magnificent forest. From December 1998 to April 1999, I have visited Tana River 3 times for two weeks each under the auspices of Tana River GEF Primate Monitoring Project as a Research Assistant. In every visit I have failed to understand the subtlety in ecological difference in such a short distance and am always startled by the settings of the gallery forest. The gallery forest is patchily distributed, comprises of 71 forest patches which vary in size (Butynski and Mwangi, 1995).

The Tana River Red Colobus *Colobus badius rufomitatus* and Tana River Crested Mangabey *Cercocebus galeritis galeritis* are endemic to the gallery forest along the flood-plain of the lower Tana River in eastern Kenya. These are two of Kenya's rarest mammals in this complex, unique and rare habitat in eastern Africa. Both subspecies are listed as "endangered" in IUCN Red Data Book (Lee *et al.*, 1988). The gallery forest is also home to Zanzibar Galago *Galago zanzibaricus*, listed as "vulnerable" in Red Data Book, Tana Sykes's monkey *Cercopithecus mitis albitorquatus*, a subspecies endemic to the region (Kingdon, 1971). Other primates include vervet monkeys *Cercopithecus aethiops pygerythrus*, yellow baboons *Papio cynocephalus cynocephalus*, Gamett's galago *Otolemur garnettii*, and Senegal galago *Galago senegalensis*. In addition Tana River holds a number of globally threatened, regionally threatened and range restricted birds. Globally threatened birds include Southern Banded Snake-Eagle, Fisher's Turaco (range-restricted), East Coast Akalat, White Winged Apalis (range-restricted), Tana River Cisticola (range-restricted), Basra Reed Warbler and Plain-backed Sunbird. Regionally threatened birds include African Finfoot, African Darter, Saddle-billed Stork, Ayres's Hawk Eagle, Pel's Fishing Owl, Violet Wood-hoopoe, Scaly Babbler, Little Yellow Flycatcher, and Uluguru Violet-backed Sunbird occurring in the nearby bushes (Bennun & Njoroge, in press). At least 61 plants are globally or nationally rare. The Tana River poplar *Populus ilicifolia* is endemic to northern Ewaso Ng'iro, Tana and Athi/Sabaki rivers.



Tana River and forest showing emergent Tana River Poplar *Populus ilicifolia*, endemic to the area. Photo by T. Butynski

In the morning, the cool forest air is broken by calls from local birds and at night owls and night primates (galagos) calls can be heard from afar. The gallery forest is under threats of farmland extension, fires, felling of large trees for dugout canoes, pole cutting and honey harvesting. The forest being fragile and dependent on Tana River flooding regime is also threatened by construction of Mutonga and Lower Grand Falls Dams which are due to be completed in about the year 2001 and will reduce or affect the flooding of the river. All these pose a great threat to the rich and unique life forms dependent on the forest.

The conservation of the gallery forest and its biodiversity is of considerable importance to Kenyans and the world. This depends greatly on the local communities around the forest. The agricultural Pokomo community, which interacts with and influences much of the forest, believes that the land belongs to them and that they have a right to be inside Tana River Primate National Reserve (TRPNR). They claim to have been living and conserving the forests since time immemorial. The bone of contention is that the forest patches are reducing in size and primates populations are decreasing.

During my visits I noticed certain changes in the forest, both inside and outside TRPNR. Of particular interest is Kipende Forest which has lost 60% of its area to farmlands. The only red colobus group found there in a 1994 census (Butynski & Mwangi, 1995) could not be located after a whole day's search by 4 people. If this is the case, the red colobus's range has been reduced by about 5 km, or so, on the western side of Tana River. In Mnazini South Forest, at least 5 trees have been cut for dugout canoes and 3 others by honey harvesters in almost every hectare. This has left primate groups in the area in a desperate habitat. Red colobus which rely on trees greater than 10 m in height for food,

movements and shelter were restricted to the edges where canopy is more closed. Likewise, the crested mangabays could only be located within forest edges due to thick undergrowth. In Baomo South the situation is even worse, trees have been cut down or burned indiscriminately in many parts. No farm extension was seen and therefore the action could be ill directed either towards the primates or TRPNR management. At the moment it is difficult to say how these changes have affected the primate populations and other species found in the area, but by the end of the GEF Project this may become clearer and eventually a protocol established for the preservation of this rare

and unique habitat.

Current conservation programs try to integrate local communities in order to gain support for their success. This comes in the form sustainable utilization or harvest of natural resources so that local communities can benefit directly or indirectly. Sustainable utilization/harvest is a generally misunderstood and misused concept in today's conservation effort. It generally means extraction of natural resources in a manner that the resource in question is not depleted and can renew itself so that similar levels of exploitation can occur indefinitely. However, although sustainable harvest has too often been equated with effective conservation, it has been an activity whose objective is the material welfare of a select group of people who can redefine and increase harvest accordingly (Ludwig *et al.*, 1993). Can Tana River Gallery Forest be used at a sustainable rate?

One needs to consider a number of important facts:

- Trees selected for canoes are hard woods, *i.e.*, *Mimusops fruticosa*, *Diospyros mespiliformis*, among others, due to their durability. The trees form a major dietary component for the endangered primates. It seems as if certain



Tana River Crested Mangabey *Cercocobus galeritus galeritus*, an endemic species. Photo by J. Kirafhe.

individuals rely on dugout canoes for economic gain and cut as many trees as they can, thus creating a non-sustainable harvest, as far as conservation is concerned.

- Most indigenous trees require over 30 years to become mature enough to provide good canoes let alone food and shelter for the primates. One wonders who will set standards such that only old unproductive trees are removed and are equally replaced by regenerating ones.
- Cutting of trees creates big gaps as a result of the felled tree pushing over other trees. Because Tana gallery forest is fragile and on sandy banks, gaps created by fallen trees are subject to being enlarged by wind damage. Forest conditions deteriorate, giving way to new, emergent, light demanding plants and eventual transition from forest to bushland takes place, as is the case found in Mnazini South Forest. This becomes uninhabitable to arboreal primates and other animals too.
- How does one explain honey harvesting in Mnazini South Forest? This is not, and can never be, sustainable harvest as somebody kills a tree to obtain honey and leaves the rest rotting. Probably sustainable harvest in Tana could only be obtained by use of fronds and withes from palms due to their fast development rate.
- Human population growth today plays a prominent, probably predominant, role as the main factor in tropical deforestation and in the loss of species (Myers 1993). The human population in Tana River is increasing, as it is in all other parts of Kenya. On the other hand the natural resources in the forest are either constant or decreasing. This means that if use of forest resources is to be a course for economically maintaining the community, we shall have to harvest beyond sustainable margins. This is not justifiable from the conservation viewpoint.

It is evident that some of the few forest patches I visited are denuded although others inside TRPNR and outside are in perfect condition. The situation is that some local communities are believed to be using the forest resources wisely and at a sustainable level. Forest patches are owned by villages or clans and removal of trees is controlled by elders. This may be in good faith for sustainable use and future conservation of the area. While this may be true in certain parts, in others they seem to have lost direction on utilization of the resources and harvesting is not properly controlled. The fact is, if this continues unchecked, we are going to lose a great deal of this unique and rare habitat with its meticulous biodiversity. An understanding between the stake holders (conservationists and local communities) and NGOs working for good of conservation is required. The time for action is now as "the journey of tomorrow, one should start preparing today".

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RAPTORS AND OTHER BIRDS ASSOCIATED WITH THE LAKE BARINGO CLIFFS, KENYA

Introduction

Africa has a large variety of raptors (Brown, 1970) and yet they are one of the most threatened bird families in Africa (Steyn, 1982). While land-use patterns are known to influence raptor populations (Sorley & Andersen, 1994), the absence of "first-world" development and urbanization through much of Africa has resulted in many regions maintaining healthy raptor populations (Brown, 1970). There is a need for long term monitoring programmes and recently raptor population data from Africa was under the spotlight when information was needed on the population status of wintering Lesser Kestrels *Falco naumanni* (McCann, 1994).

Kenya is one of the leading African countries in the field of raptor research, primarily due to contributions by the late Leslie Brown (e.g. Brown, 1980). However, some anomalies still exist, such as the apparent scarcity of resident Common Kestrels *F. tinnunculus rufescens* in East Africa (Brown, 1980).

We conducted a survey of cliff nesting raptors on the basalt cliffs at Lake Baringo, Kenya, with the aim of documenting the abundance of raptors along the cliffs.

Study Area and Methods

Lake Baringo is a freshwater lake situated in the Rift Valley in central Kenya (0° 36'N 36° 0'E). The main vegetation type of the area is *Acacia* woodland

dominated by *Acacia tortilis*, *A. reficiens*, *A. milifra* and *A. elatior*, ranging from tall trees in the south to arid thornveld on rocky ground in the west (Stevenson, undated). The climate is hot and dry with a variable annual rainfall averaging 656 mm per year, most of which falls between April and August. The mean daily temperature ranges from an average minimum of 16.7°C and average maximum of 32.5°C (data from 1957-1980, Kenya Meteorological Department records).

There are several rows of basalt cliffs on the eastern and western sides of the lake. This study focused on the cliffs west of the lake (Figure 1). There are three separate rows of cliff, with the longest next to the Marigat-Loruk road (cliff 1) (Figure 2). There is a smaller cliff (cliff 2) approximately 1 km to the west while the third (cliff 3) was not included in this survey as it was considered too small and broken to be suitable for breeding raptors. A single west facing cliff in the south was also included in the survey.

The survey was conducted between 5 and 21 October 1995. The survey consisted of two components: 1) a set of habitat characteristics were collected at set times of the day from a number of equidistant positions along cliff 1 (Figure 2); 2) notes were made on all raptors seen while in the vicinity of both cliff 1 and 2.

We recorded a number of parameters relating to the cliff, the surrounding habitat, human disturbance, and bird diversity and abundance that could possibly affect raptors using the cliff. Birds were counted for 1 hour, either during the early morning (before 9:30) or the late afternoon (after 15:30) unless disrupted by heavy rainfall.

Results

Cliff survey

The surveyed cliff was 9,300 m long running roughly in a north-south direction. Fifteen of the 17 survey points were along this line of cliff, and the remaining two were on two extensions of this cliff to the south of approximately 500 m each. The average height of the cliff was 43 m (s.d. 14.9, $n=17$) and the cliff at 16 of the 17 surveyed points faced east. Twelve (71%) of the sample cliffs were vertical and 5 (29%) were broken and therefore accessible to mammals or humans. Trees were relatively common on the cliff (53%) and Vervet Monkeys were sometimes seen foraging in these trees. A river ran at the base of 65% of the cliff of which water was present only for 12%. The river sometimes caused a gully (24%) which may have made the cliff unsuitable for species that prefer an open view from the cliff.

The habitat surrounding the cliff consisted of 47% riverine bush, 41%

thornveld and 12% low scrub and the bush was higher than 3 meters in 47% of the area surveyed. Approximately half of the surveyed area had dense ground cover (53%) and the overall structure of the bush was also dense (59%).

Human presence was high in the vicinity of the cliff with people fetching water from the river below the cliff, herdboys attending stock, tourists birdwatching and numerous people walking up paths through the less steep sections of cliff to their houses on the flat area above the cliffs. Human presence was considered low in 47% of the cliff surveyed and paths up the cliff were recorded at 5 of the 17 survey points.

A total of 90 bird species were recorded during the survey. On average, 19 species were seen during the hour at each survey point (minimum = 8, maximum = 29) and on average, 81 individuals per hour were recorded (minimum = 12, maximum = 267).

Birds of prey densities along the cliffs

Seven species of birds of prey were recorded during the survey. Common Kestrels and Shikras *Accipiter badius* were recorded at 8 (16 individuals) and 7 (10 individuals) of the survey points respectively. Individual



Figure 1 A map of Lake Baringo showing the location of the infrastructure and cliff line. The area in figure 2 is highlighted by a stippled box.



Figure 2. A detailed map of the cliffs with an indication of the locations of raptor pairs on the cliffs. The three main cliffs are numbered and the two cliffs south of cliff 1 are indicated as short lines.

Peregrine Falcons *Falco peregrinus* and Dark Chanting Goshawks *Melierax metabates* were recorded on three occasions, and a pair of Verreaux's Eagles *Aquila verreauxi* on two occasions. Single sightings of Lanner Falcons *Falco biarmicus* and two Pygmy Falcons *Polihiherax semitorquatus* were also recorded.

Other species recorded included Brown Snake Eagles *Circaetus cinereus* roosting on the cliff, and Gymnogenes *Polyboroides typus*, Bateleurs *Terathopius ecaudatus*, Fish Eagles *Haliaeetus vocifer*, Bat Hawks *Macheiramphus alcinus*, Hobby Falcons *Falco subbuteo*, Pallid Harriers *Circus macrourus* and Steppe Buzzards *Buteo buteo vulpinus* flying above the cliffs.

We were able to estimate the number of resident pairs along the cliff (Figure 2) during the second component of the survey. There was one Verreaux's Eagle pair with two nests approximately 200 meters apart. One pair of Lanner Falcons were regularly seen displaying above and on the cliff. Four pairs of Common Kestrels were found, although one pair were only seen during the early mornings. Of these four pairs, three pairs were seen copulating and two of the males were seen feeding the female. Two pairs of Shikras were seen on sections of cliff that had high riverine vegetation below.

Raptors seen in immature plumage which could possibly have been raised in the area included Dark Chanting Goshawks, Shikras, Peregrine Falcons, Lanner Falcons and Common Kestrels.

Other birds associated with the cliffs

Other cliff inhabiting birds seen included Fantailed Ravens *Corvus rhipidurus*, Hemprich's Hornbills *Tockus*

hemprichii, Cliff Chats *Thamnotaenia cinnamomeiventris*, Red-winged Starlings *Neocinchla gutturalis*, Bristle-crowned Starlings *Onychognathus salvadorii*, Alpine Swifts *Apus melba*, Rock Martins *Hirundo fuligula fusciventris*, Rufous-crowned Rollers *Coracias naevia* and Speckled Pigeons *Columba guinea*.

The many fig trees on the cliffs provided shade and food. Species associated with the fig trees included a pair of Woolly-necked Storks *Ciconia episcopus*, Jackson's Hornbills *Tockus jacksoni*, Blue-naped Mousebirds *Urocolius macrourus* and Yellow-vented Bulbuls *Pycnonotus barbatulus*.

Discussion

The results of the cliff survey at Lake Baringo indicate that the area represents an ideal site for cliff-associated birds and raptors. It is high enough to provide protection and nest sites, has a high density of invertebrate and vertebrate prey, and the animal life around Lake Baringo probably also provides a rich source of food (Stevenson, undated).

Furthermore, there are not many cliffs in the Rift Valley basin and one would expect a high density of cliff-nesting raptors at the Lake Baringo cliffs.

However, we found only six pairs of breeding resident raptors inhabiting these cliffs. (The nesting habitat of the two pairs of Shikras was the high riverine vegetation so cannot be considered cliff nesting raptors.) Surprisingly, all these pairs were confined to a section 2,500 m approximately in the middle of the cliff line. This section was the highest part of the cliff line (mean height 53 m, s.d. 11.5m), was vertical, relatively free from trees and had a dry river bed below it with high riverine thornveld. While there were no paths up this section of cliff, the human presence at the base of the cliff remained relatively high. This, however, did not seem to visibly affect the raptors, and the Common Kestrels were relatively tame when approached.

It is possible that the area is unable to support more than one pair of Verreaux's Eagles which specialize on Rock Hyrax (Gargen, 1990). Considering that suitable cliff nesting habitat is relatively scarce in the basin of the Rift Valley and that bird densities were relatively high below the cliff, it was expected to find several pairs of Lanners or Peregrine Falcons. Furthermore, while Common Kestrel nesting densities were similar to those measured in low density populations in South Africa (Van Zyl, 1993), much of the cliff was unused by the kestrels. In two cases, these sections were used by individual kestrels as roosts, and may later be used as nest sites should these individual kestrels find mates.

This study shows that raptors selected the highest section of cliff for their nesting sites. Jenkins (1991) has shown a similar trend in Peregrine Falcon populations from the tropics that selected higher cliffs

than their temperate counterparts. He also showed that there was a significant decline in Peregrine Falcon density with decrease in latitude as well as a decline in food availability. It is possible that cliff height also plays an important role in the breeding of Kenyan Lanners and Peregrine Falcons. The low number of Common Kestrel pairs can possibly be explained by a lack of mates (thus explaining the two single roosting birds) or high predation on kestrels on lower sections of cliff.

Other birds of prey seen along the cliffs at Lake Baringo are probably resident but not cliff dwellers. These include the Fish Eagles, Bateleurs, Gymnogones and Bat Hawks. The Hobby Falcons, Pallid Harriers and Steppe Buzzards were probably on migration and were all recorded flying in a southerly direction. Shikras use the cliff for hunting, especially through the trees along the top, or for perching in the trees on the cliff face. However, the high riverine vegetation in front of the cliff would provide suitable nest sites for this species.

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SHORT COMMUNICATIONS

OBSERVATIONS OF DODDER (*CUSCUTA CAMPHESTRIS* YUNCKER) PARASITISM ON HEDGES IN NAIROBI

Although most plant diseases are caused by fungi, bacteria, viruses, and nematodes, there are few seed plants which are parasitic on living plants. These parasites could be entirely or partially dependent on their host, affecting either roots or stems. Within the last two years, there have been a number of enquiries at the East African Herbarium on the identity and methods of controlling the parasite infecting ornamentals and seedlings in nurseries. Moreover, observations made in Nairobi reveal that hedges, especially planted with *Bougainvillea* sp., at Jeevanjee Gardens and other sites are infected. The parasite has been identified as dodder, *Cuscuta campestris* Yuncker, a member of the sweet potato family (Convolvulaceae). Discussed here are diagnostic characters, the biology, and methods of eradication of the parasite.

Cuscuta (Dodder, Love-vine, Armabel) is a genus consisting of eight species in East Africa, parasitic on both wild and cultivated species (Verdcourt, 1963; Agnew & Agnew, 1994). These are non-chlorophyll bearing, leafless, twinning plants which attach their yellow, orange, or pink thread-like stems to the stems or other parts of the host.

The first appearance of the parasite in the field is noticed as small masses of branched, thread-like, leafless stems which are devoid of the green pigment and twine around the stem or leaves of the host. The leaves are represented by minute functionless scales which are evident on close examination. When the stems come in contact with the host, minute root-like organs, the haustoria, penetrate into the host cortex and serve as an anchor as well as organs of food absorption. When the relation with the host is firmly established the dodder plant has no connection with the soil.

The tiny greenish yellow flowers occur in clusters. The fruit is a capsule producing tiny grey or reddish-brown seeds. A single plant may produce as many as 3,000 seeds. The seeds germinate just like the seeds of other plants. Usually their germination occurs a few days after the germination of host plant seeds in the field. The young seedling of the parasite is a slender, yellowish, unbranched thread. The top end is raised into a more or less vertical position and the growing tip moves in a circle in search of a suitable host. When a support is reached the young stem begins to twine around it. If the support is a dead piece of wood or non host plant, the parasite stem soon dies. On a susceptible host the stem of dodder soon produces haustoria to establish itself. The lower part then dies and the stem becomes free from soil.

The dodder perpetuates through seeds which fall on the ground and remain dormant until a favourable season returns. Portions of the stem are also resistant

to adverse weather. Many East African species are perennials.

The parasite may be introduced into a field and spread by any of the following means: (i) as impurity in the crop seed; (ii) as seeds and stem pieces moved by irrigation water; (iii) as stem pieces present on the dry straw from invested fields; (iv) as seeds in manure; (v) as stem pieces transported by cattle and farm implements; (vi) as stem pieces carried by birds or strong winds.

Eradication

As discussed by Singh (1990), it is necessary to pay full attention to practices to prevent introduction of dodder, and if present to guard against its spread by: (i) the selection of dodder free seed; (ii) the avoidance of dodder invested cattle fodder; (iii) preventing the movement of grazing animals from invested to clean fields; (iv) restricting the flow of irrigation water through infested areas; (v) avoidance of the use of dodder-containing manure; (vi) destruction of the crop by burning before seeding; and (vii) by leaving the ground fallow after selected eradication measures have been completed and then followed with a five-year rotation beginning with a non-host crop.

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ANOTHER MATING BETWEEN THE DIADEM BUTTERFLY AND TRIMEN'S FALSE ACRAEA

In the last issue of the *Bulletin* I reported a cross-species mating in one of the large Kipepeo flight cages (Gordon, 1998). I had found a male diadem (*Hypolimnias misippus*) coupling with a Trimen's False Acraea (*Pseudacraea boisduvali*). On the very day that that issue of the *Bulletin* went to press, I called round at Kipepeo and was told that Rose Justus, a Kipepeo staff member, had seen a male diadem mating with another species. This had happened in one of the small cages (60 x 30 x 30 cm) used to transfer butterflies from the forest to the Gede Flight cages. When I quizzed her about it, she couldn't remember the scientific name of

its partner, but was able to point it out in Larsen's field guide. It was a female *Pseudacraea boisduvali*.

So at least one of the speculations I had made in the last issue can now be ruled out. The first mating I observed was obviously not a freak event with no particular significance. There must be some common feature in the mating behaviour of the two species which encourages them to get together. But the bigger question I had raised remains: was it rape or female choice? Both incidences having occurred in confined spaces would suggest that perhaps the first choice is the more likely; the confined space making it more difficult for the female to avoid the male's advances. An experimental approach might prove interesting.

Ian J. Gordon, Box 10018 Bamburi P.O., Mombasa, Kenya

July 31st, 1999

The Editor,

Dear Ms Depew,

As the Karen & Langata District Association environmental representative—a far too grand title for what I actually do—I try, with other members of the committee, to find out where indigenous trees are being cut down in this area, once a haven for birds and small animals. We try to prevent this happening. A great deal of felling of huge, old eucalyptus trees has been taking place recently on the banks of the Mbagathi river, with permission from the local chief. We did not consider this particularly important as no indigenous trees were cut and the plot owners concerned are keen to replace the gums with indigenous trees. However, Dave Richards was much concerned by the destruction on the river and compiled the enclosed list of animals and birds disturbed and displaced, probably permanently, by the felling of these trees.

Mr. Richards' information has taught me something I did not know and I suspect many other conservation-minded people don't either. It is clear from what he says that all tree-felling is bad, whether indigenous or exotic.

I have his permission to send you his list and ask you to publish it in the next *Bulletin* if you wish.

Yours sincerely,

Clare Gaier (Mrs.), P.O. Box 24923, NAIROBI, Kenya

EUCALYPTUS TREES

This is a list of Mammals and Birds that I have observed in the belt of Eucalyptus which have now either been

cut down over the last months or are slated to be cut down.

Greater Galago (Bush Baby): A number are or were resident. I have seen them feeding on the resin.

Syke's Monkey: A troop resident in the area. Suspect that they too eat the resin, but I have never observed this action. Suspect the Eucalyptus are only used as a method of travelling from one area to another. This is important as it keeps them above the ground and away from dogs.

Black-faced Vervet: From time to time a small troop visit the area. Comments as above.

Tree Hyrax: A number resident.

Bush Pig: Until recently Bush Pigs were resident. As I am regularly finding snares I suspect that they are doomed anyway.

Bat Hawk: A pair is resident in the area. Some years ago they attempted to breed but their nest was taken over by a pair of Greater Sparrowhawks. In South Africa Bat Hawks prefer Eucalyptus over all other trees.

Greater Sparrowhawk: A pair breed from time to time. Their nest tree has now been cut down.

Augur Buzzard: A pair breeds from time to time. One of the pair is melanistic (all black). I believe their nest tree is slated to be cut down.

Montane Nightjar: Several pairs breed every year in the leaf litter under the Eucalyptus trees.

Tambourine Dove: Several pairs are resident. They feed in the deep litter under the trees.

Red-eyed Dove: Have made their nests in the lower branches of the Eucalyptus several times.

Bronze Sunbird: Often build their nests hanging from the lower branches of the Eucalyptus. They also feed on the flowers of the Eucalyptus.

Variable Sunbird: Feed on the Eucalyptus flowers.

Northern Double-collared sunbird: As above.

Scarlet-chested Sunbird: As above, but in South Africa have been recorded regularly building their nests in Eucalyptus trees.

Helmeted Guineafowl: A small flock visit from time to time. Feed in the leaf litter.

The following birds have all been recorded breeding in Eucalyptus trees:

Pied Crow, Ring-necked Dove, African Goshawk, Little Sparrowhawk, Ovambo Sparrowhawk, African Hawk

Eagle, Cattle Egret and Black-headed Herons. **Note:** The Black-headed Heron nest colony in the Nairobi Railyards is famous in the ornithological world.

Dave Richards, PO Box 24545, Nairobi, Kenya.

29th July, 1999

OF TERMITES AND ASSOCIATED PLANTS

Where I live, in extremely dry country off the Mombasa Road between Lukenya and the Machakos turnoff at Makutano, scanty rain in March and mid-April of this year, and an isolated 3 mm shower at the beginning of June afforded little benefit to the countryside. The so-called short rains at the end of 1998 proved very short indeed and passed almost unnoticed, my main rain tank receiving only about 40 cm of guttered catchment during that whole season. The past year has been a very dry one, with the savannah in typical gold and grey colouration for most of it, mid-day shade temperatures around 35° C and frequent windstorms.

Since the beginning of June a curious phenomenon has been taking place, with winged termite alates emerging from their nests in the early mornings on an almost daily basis, much to the delight of insectivorous birds, which have been rather hard-pressed for food. On 26th June, three (probably) white-bellied bustards dominated pickings (noisily) of emerging alates among long dry grass a little way in front of my house, and the following day a solitary Kori bustard barely lifted his head before mid-morning from another nest about 100m to the east.

I had always been under the impression that alates typically emerge in the evenings following rain, a view reinforced by the natural history notes in Tim Corfield's *The Wilderness Guardian*. The comprehensive *Termites and Soil* (1971) by K. E. Lee and (appropriately) T. G. Wood offers further information on swarming patterns, but states "Flight or swarming is usually synchronised, not only within the one colony, but also between different colonies of the same species. It is commonly associated with seasonal weather patterns, such as well-defined periods of rainfall..."

Of the West African harvester termite *Trinervitermes trinervius*, (we have many harvester nests locally but of unidentified species—where are you Dr Jo Darling?), it states that this species "harvests all year round" as ours appear to do, and that together with *Amitermes evuncifer* and *Cubitermes severus*, their "maximum building activity coincided with the onset of heavy rains and the flight of alates..."

Could any EANHS member perhaps throw light on

the local and apparently atypical, behaviour pattern at a time of year when rain, of which there appears little prospect, would be more than welcome?

After first rain in mid-April, curious paired seed-leaves, flat on the ground and about the size of a little fingernail, appeared on and around a harvester termite nest near my gate, and produced from the centre a small Y-shaped green shoot which elongated rapidly and branched to sprawl along the soil surface rather like a prostrate *Bowiea kilimandscharica*.

Lise and Tim Campbell, always invaluable where botanical oddities and obscurities are concerned, visited on 24th April by which time tiny flowers and small rounded fruits were visible. Lise identified the plants as *Myrmecosicyos messorius* of the family Cucurbitaceae (p. 91 in *Upland Kenya Wild Flowers* by A.D.Q. Agnew and Shirley Agnew, 1994, plate 23—WHY do plates not include page numbers for the relevant text in this otherwise excellent reference? A perennial source of irritation not to mention unnecessary wear and tear on the book).

It is apparently found only in this botanical area and in some parts of the Rift Valley, always on or around harvester nests, although by no means all of them. Harvesters were observed rolling ripe fruits into nest openings—do they harvest it to farm? And if so, what is their relationship with the plant? As further fruits ripened I distributed them among other nests in the vicinity. These fruits also were rolled promptly into nest openings; the next rains will, presumably, tell whether seeds will germinate.

While the habitat offered to a small prostrate plant, by the bare ground surrounding harvester nests, spares it from competition with taller or more aggressive species of vegetation, this exclusive relationship must surely offer some form of mutual benefit as well.

When Dr. Andrew Agnew was engaged in fieldwork to update his excellent book, he had apparently not seen this plant in habitat until Lise and Tim brought him to

the area, and it is Tim's (as ever) first-class botanical drawing of *Myrmecosicyos messorius* in the finished work.

Dee Raymer, P.O. Box 2356 Machakos Kenya, Tel. messages: 02 603777/603659, Fax messages: c/o 02 501758/600557

HARD TIMES FOR TERMITES?

I suspect we all share Dee Raymer's impression that termite alates emerge after rain, and also her surprise at seeing this happen during a drought. The swarming of winged termites (and also ants) occurs when the chances of founding a new nest are maximal. Normally this is when the first rains fall, and these nuptial flights are particularly intense after a prolonged dry period. Such conditions herald a flush of plant productivity (ensuring abundant food resources), favourable microclimates, and soft soil in which new nests can be easily excavated. They also provide cues for synchronising flights over a wide area, thus swamping predators and maximising the possibility of outbreeding between males and females from different nests. So Dee's observation is indeed curious.

Could it be that hard times for termites force them to cut their losses? Feeding and maintaining thousands of alates that make little or no contribution to the upkeep of a colony must be a costly business. If the rains are seriously delayed, might it not be better to forget about founding new nests and kick them out, hoping for better times next year?

Ian J. Gordon, Box 10018 Bamburi P.O., Mombasa, Kenya



Myrmecosicyos messorius by Tim Campbell. Reproduced with permission from *Upland Kenya Wild Flowers* by A.D.Q. Agnew and S. Agnew.

SPECIAL FEATURE

The author of the following essay won the United Nations Volunteer Essay Competition for 1998. This article is a slightly shortened version of his winning entry.

LAKE VICTORIA—A THREATENED COMMON HERITAGE

During my childhood, growing up by the beautiful glittering shores of Lake Victoria I was ever fascinated by this vast expanse of crystal fresh water striding aloft the East African Equatorial region. My peers and I knew it as it was commonly called "Nami Lolwe", to us meaning the lake without termination in the local Luo dialect. Lake Victoria has, however, witnessed changes in the recent past that have come at a great ecological and environmental price, threatening the very existence of the lake.

Formed as a result of intensive plate tectonic activity within the earth crust many years ago and measuring approximately 400 kilometres long by 200 kilometres wide, Lake Victoria ranks comfortably as the world's second largest freshwater lake and by far the largest in continental Africa. Its waters are shared among the three East African states of Kenya, Tanzania and Uganda.

The lake's inflow is from numerous rivers and streams with their sources in the high rainfall lake basin highlands. Chief among them are rivers Kagera in Uganda and Nzoia in Kenya. Others are rivers Nyando, Migori *etc.* The great river Nile is the only major outflow. These inlets and outlets maintain the hydrological balance of the lake.

Lake Victoria has a catchment area of approximately 47,709 km², of which approximately 10%, falls within Kenya. The catchment area intersects the borders of other Central African countries such as Burundi, Rwanda and some parts of eastern Democratic Republic of Congo. It is from this that the problems afflicting Lake Victoria assume an international perspective because they put at risk the livelihood of in excess of 30 million people whose lives are directly dependent on the lake's natural resources.

For millions of years, Lake Victoria has served and met the diverse socio-economic and cultural needs of the lake basin dwellers, as a source of water for essential domestic purposes like drinking, cooking, washing, *etc.* And also for agricultural and industrial uses. However, the lake is encountering a number of threats and problems and alarm bells are already ringing, sounding the death knell for this precious gift of nature.

The threats facing Lake Victoria basically fall into the following broad categories: pollution of the lake water, over-exploitation and misuse of the lakes resources and its associated wetlands, the water hyacinth menace, the introduction of the Nile perch and

destruction/reclamation of the swamps. However, these threats, as varied as they are, do not occur in isolation from each other but to a greater degree are intricately connected and, more often than not, overlap—as do their origins and their effects, which range from widespread poverty and mass unemployment to serious epidemics and species extinction.

Pollution in Lake Victoria has reached unbearably alarming proportions and still continues unabatedly from all corners of this lake. This contamination of the lake through the introduction of unwanted foreign bodies, has, over a period of years, has lowered the water quality considerably, thereby leading to proliferation of waterborne diseases and epidemics like cholera, dysentery, bilharzia, *etc.*, which have become widespread. This has rendered the lake water hazardous, especially for human consumption. Pollution is mainly of two types: point source pollution and non-point source pollution. In the former case, which is more prevalent, the source of pollution as well as the pollutants are known, while in the latter case the source of pollution is unknown, although the pollutants may be identified through analysis.

Point source pollution usually comes from domestic, commercial and industrial wastes and effluents in solid but more usually in liquid and, less often, in gaseous forms. Domestic effluent pollutants include both biodegradable and non-biodegradable wastes. Biodegradable wastes include food remnants, fruit peels *etc.* Non-biodegradable wastes include broken pieces of glass, plastic containers, plastic bags and tin cans, among others.

Lake Victoria also receives sewage wastes, which are usually inadequately treated or not treated at all, from a number of towns and cities situated along its shores and bays. These include Kisumu in Kenya, Jinja in Uganda and Mwanza and Musoma in Tanzania, among others. These urban centres mostly lack modern sewage treatment plants; those present were built many years ago and their capacities have been overstretched by the ever increasing wastes resulting from human population growth.

These urban centres are also sites of heavy industrial plants dealing in food processing, plastic manufacturing and oil refining. These industries release toxic and noxious by-products in form of biochemical and organic pollutants, *e.g.*, paraffin, diesel and other organo-metallic compounds into Lake Victoria. In addition, pharmaceutical and biological wastes from hospitals and other research institutions, which are highly toxic if not safely disposed of, do likewise find their way into the lake.

Mining wastes from areas like Kehancha and Kakamega, both in Kenya, where gold is mined, usually contain heavy metals such as mercury, which apart from being a pollutant, is accumulated within the food chain and, hence, poses a serious health hazard. Indeed reports from recent research, undertaken to determine the amount of mercury in the lake, indicate that the levels are becoming critical. These might result in extensive human and animal mortality through a condition

christened "Minamata" disease because of the havoc it wreaked in Minamata Bay in Japan several years back.

Other point source pollution includes waste materials from fish smoking and slaughter houses and the literal dumping of solid wastes which are returned to our beaches.

Non-point source pollution results from materials carried into Lake Victoria by streams, rivers and surface run-off. It is usually, however, more difficult to control. It contains agro-chemical pollutants like pesticides, fertilisers, fungicides from agricultural areas along with huge amounts of nutrients, e.g., silt, nitrogen and phosphorus. Often these chemicals have become indispensable in the agricultural industry which is highly developed around Lake Victoria. Other inland industries and factories are guilty of this type of pollution by dumping their wastes into streams and rivers that finally discharge them into the lake.

In Kenya, sugar industries in the western sugarbelt region like Mumias, Nzoia, Chemilil, Mithoron and South Nyanza Sugar Companies are notorious for dumping effluents into adjacent rivers like Nyando, Nzoia and Migori which end up in Lake Victoria.

Pollution in the lake has increased the rate of eutrophication which has resulted in the emergence of algal blooms through the increase of biological oxygen demand (BOD). These have in effect provided favourable conditions for the uncontrolled growth of the infamous weed, water hyacinth. The water hyacinth has proceeded to colonise areas important to native aquatic plants and also hinders the penetration of light to the under water surfaces—a factor essential for the growth of underwater plants. This impacts negatively the food chain within the lake ecosystem and disrupts it substantially.

The latest threat to the lake, the effects of which have been severely chronic with overwhelming and far-reaching implications, is the invasion of the lake by "alien" aquatic weeds like the *Salvinia salvinia molesta*, water lettuce *Pistia stratiotes* and the water hyacinth *Eichornia crassipes*. These three alien weed species have infested Lake Victoria at different times and to varying degrees. However, of the three aquatic weed species, water hyacinth stands tall as the most widespread and threatening to the ecology of Lake Victoria and by extension to the lives of many people and animals.

As attractive as it appears, with magnificently dark green leaves and beautiful blue/purple flowers, its uncontrolled growth has resulted in thick mats of vegetation which have, in effect, colonised more than half the of the lake surface. The beauty of this weed is a complete irony when its hazardous effects are considered and it reads like a paradox of beauty for suffering. A member of the family Pontederiaceae and a native of the South American Amazon basin, it is theorised to have been brought to tropical Africa mainly as an ornamental plant and, of course, it has found its way into many lakes. The success of this weed in tropical lakes, including Victoria, is attributed to many factors. Firstly and most important, unlike the indigenous

floating aquatic plants, which are in natural equilibrium with the parasites and predators in their environment, this alien species proliferates outside its natural habitat because it is freed from the controlling influence of its natural enemies. Secondly, the water Hyacinth has found a new-nutrient rich habitat in Lake Victoria because this lake, being highly polluted, has a correspondingly high degree of eutrophication. The above factors, combined with the rapid spread of the water hyacinth (both through stolens and large quantities of long-lived seeds), can result in the population sometimes doubling in from 5 to 15 days. The water Hyacinth's spread in Lake Victoria is unmistakable, although it is more prevalent on the Kenyan and Ugandan waters and than on the Tanzanian side. It is mainly due to the choking effect of this notorious weed that the problems of Lake Victoria have been brought to the attention of the rest of the world, by both the print and electronic media after the hue and cry of local dwellers.

Over-exploitation and misuse of the lakes resources, strictly speaking, does not come *per se*, but is usually the unintended consequence of development. For instance over-exploitation of the resources of Lake Victoria is one such major problem and threat that cannot be overemphasised. More often than not the resources in question are either (ab)used or (mis)used to satisfy the short term gains of the exploiters.

Situated in a densely populated region, Lake Victoria provides nutritious food in the form of fish and other edible aquatic species, thereby forming a socio-economic base for those living in the lake basin region. Fish, being popular with the local people, has become an innocent victim of over-exploitation. Fishing has tremendously increased over a period of years, usually with an impressive annual yield. The high yield in fish catch is heavily influenced by the increase in catch of Nile perch. Nile perch *Lates niloticus* is consumed locally and also exported to markets within the European Union. Hence it is by far the most commercially important fish species in Lake Victoria. The increase in fish production has positively impacted the lake community as it is an important protein source. Over-fishing is attributed to not only the increasing demand of a growing population, but also to the sudden shift from traditionally harmless subsistence fishing methods, using traps, baskets, papyrus nets, hooks and spears, to technologically advanced, intensive, non-selective and highly sophisticated commercial fishing methods that employ the use of power boats, cotton, nylon and multifilament gill nets, bench seines and trawlers. The off-take of fish species is thought to be slowly exceeding the maximum sustainable yield (MSY), a factor that can effectively lead to their extinction.

The other problem of fishing and fisheries in Lake Victoria is attributable to the severe alteration of the drainage basin through agricultural, vegetational, urban and industrial changes, often without due regard to the traditional breeding patterns and breeding regions of the fishes. A case in point is the building, by the Kenya government in the early eighties, of the Mbita Causeway, linking the main-land and Rusinga Island. It is theorised

to have heavily impacted the breeding zones and patterns of several fish species, leading to their population decline.

Over exploitation of the lakes resources is not restricted to fisheries alone. The reclamation, through destruction and clearance, of swamps for development along the shores of Lake Victoria is cause for concern. When talking of swamplands around Lake Victoria basin, as elsewhere, the main question is "do we need swamp lands?" I am not committing myself to providing an answer to this disturbing question, but I am instead dwelling on some vital questions that arise from the many answers that are likely to come from this question. It is sad to note that swamps have been historically treated, not as wetlands, but supposedly as wastelands which should be "reclaimed" for "better" use. However, swamps serve many purposes, including the very important one of controlling silt, a nutrient inflow into the lake, and, by acting as silt sieves, regulating the amount of pollution getting into the water body.

Done in the name of development, to accommodate the increasing population and provide land for agricultural expansion, swamp clearing has increased massively. A case of conflict arising between development and the healthy ecology of Lake Victoria, is manifested clearly by the swampland reclamation project at the Yala basin, by the Lake Basin Development Authority. Although it boasts a lot of economic and, by extension, political, benefits, the reclamation of this swamp, already underway and projected to cover an area of approximately 11,500 hectares comes at an expensive and painful environmental and ecological price.

The reclaimed land is economically beneficial because it is used to grow crops like sorghum, hybrid maize and mangoes. Other ideal crops include rice, cassava, groundnuts, yams and sugarcane. Much as they may be economically desirable, some agricultural developments, like the introduction of sugarcane production within the reclaimed areas, may not be justifiable for the country in question. For the past few years, the Kenyan market has been flooded with cheap imported sugar from foreign countries and this has hit most sugar factories in western Kenya hard. Sugarcane is already going to waste in farmlands, and the factories are in fact down on their knees. It would, therefore, appear that development for this use is completely unjustifiable in comparison to importance of this swampland to the lake's ecosystem.

Lake Victoria's swamps, like any other tropical swamps, are very productive ecosystems that affect the health of the adjacent water body. It is noteworthy that the biomass produced in swamps is an indispensable element in the complex food chain within Lake Victoria itself. These swamplands are the natural habitats of many species of plants and animals, which may disappear in the name of development. These include aquatic plants like the sedges (*Cyperus cladium* and papyrus *Cyperus papyrus*) and grasses (*Vossia* sp., *Miscanthidium* sp. and *Londetia* sp.).

Bird species that inhabit the Lake Victoria swamp

lands include Papyrus Gonolek *Laniarius mufumbiri*, Black Headed Gonolek *L. erythrogaster*, Papyrus Yellow Warbler *Chloropeta gracilirostris*, and Crowned Crane *Balearica pavonina*, to mention but a few. These are swampland specialists, hence their endemism to this specific ecosystem. In addition, swamps are home to animals like the rare sitatunga *Tragelaphus spekei*, the bushbuck *Tragelaphus scriptus*, reedbuck *Redunca redunca* and the waterbuck *Kobus ellipsiprinus*, all of which may just be on their way to extinction as a result of swampland reclamation.

Another threat to Lake Victoria, with serious consequences to endemic species, is the introduction of the Nile perch *Lates niloticus*. This has been considered by some authorities as an act of "biological pollution" because the Nile perch is a predator, preying harshly and extensively on the indigenous fish species of the lake, leading to a substantial decrease in their numbers within the lake. This fact, however, has been lost on observers and stakeholders alike because of the increasing catch and the subsequent handsome prices that Nile perch fetch in both local and international markets, boosting the local economy.

While the seeming never-ending controversy over the effects of its introduction into the lake in the sixties, continues, it cannot be denied that the introduction of Nile perch has had a detrimental effect on the biodiversity of Lake Victoria. It has almost eliminated haplochromines (of which 200 species exist in the lake and nowhere else) and the endemic tilapia *Oreochromis esculenta*. This accusation is further fuelled by the evidence that large individuals of Nile perch are reported to be predominantly feeding on the young of their own species, suggesting that the number of indigenous fish species has declined to a critical level. Other species facing threats from the Nile perch are catfishes, mudfishes and cyprinids which are increasingly becoming rare.

For die-hard conservationists, the Nile perch menace does not end with the threat to the extinction of the lake's indigenous fish species only. A school of thought argues that the Nile perch has led to deforestation on a number of islands. It argues that because of its large size and oily nature, Nile perch cannot be sun-dried, forcing the local people to cut down trees and use them to smoke the fish—an outright act of deforestation. Either way the Nile perch debate, largely ignored by the press, seems to be an irreversible situation and it is only a matter of time before it shifts to land based and by extension social issues concerning Lake Victoria.

The foregoing threats all boil down to a single major problem: "threats to Lake Victoria as a common heritage," and a question: "For how long will we allow this destruction to continue?" The effects of these threats, are unacceptable and for Lake Victoria, the horoscope of time shows that it is at the sunset of its existence if quick action is not undertaken now to salvage the horrible situation.

Over and above all, Lake Victoria as earlier mentioned, is important for provision of water for domestic, agricultural and industrial uses. Water is the

source of life and therefore the threat to Lake Victoria, put in another way, is a threat to the livelihood of more than 30 million people who directly or indirectly benefit from it. It is also important for a multitude of other uses. As a common economic resource, Lake Victoria provides both direct and indirect economic benefit to the 3 East African states of Uganda, Tanzania and Kenya as well as numerous multiethnic communities. Direct economic benefits are the provision of food in the form of fish for local consumption and for export (bringing the much needed foreign exchange) and water for pilot irrigation schemes, eg., the Ahero Irrigation Pilot Project for production of rice.

Numerous towns and cities which are important centres for commerce and industries also owe their origin and existence to Lake Victoria. These include Kisumu in Kenya, Jinja in Uganda and Musoma in Tanzania, among others.

The associated swampland within the shores on the gulf of the lake provide raw materials like reeds used for small scale enterprises like producing mats, simple furniture, baskets, etc., boosting entrepreneurial growth.

Navigationally, Lake Victoria is an important waterway that has accelerated trade within the East African region. The lake traffic is high, with water vessels ranging from steamers and ferries to small boats and canoes. This increases the exchange of goods and services, promoting intra- and interstate commerce.

Tourism has been a booming business, as tourists are attracted to the magnificent scenery and animals of Lake Victoria. Scenic areas include Ndere National Park and Kisumu's Impala Park. They also engage in other diverse activities like boating, swimming, birdwatching and sightseeing. The indirect benefits coming from lake tourism are employment in hotels and lodges, transport and fuel sales, shopping, revenue provision through state and local taxes, as well as park fees. These economic benefits, as lucrative as they are, will soon be placed in historical dustbins by the threats facing the lake.

The ecological and environmental aspects of these threats is equally more disturbing. Lake Victoria maintains a unique biodiversity; it has a rich community of both aquatic fauna and flora. Among the faunal invertebrates are the benthic or bottom dwelling organisms like the leeches, water mites, aquatic worms and aquatic forms or stages of insects, clams and snails. Other fauna include zooplanktons, insects, amphibians, particularly toads and frogs, reptiles, like monitor lizards, turtles, tortoises and crocodiles, birds and mammals, eg., the hippopotamus.

The spice of life in Lake Victoria is however the fishes, a group that has received the greatest attention because of the magnitude of their economic importance. They are categorised into four major groups based essentially on habitat requirements. Included in the first group are the deep water fishes eg. *Bagrus docuiae*, *Morayia kanaumae* and the haplochromines. Group two is largely confined to fishes that have the tendency to migrate upstream in rivers during rainy season, i.e., the anadromous species like *Barbus altianalis*. Mud dwelling fishes which interestingly are capable of staying

buried in the mud for long periods during the dry seasons fall into the third group, herein are also included fishes like the *Protopterus aethiopicus* and *Clarias* sp. The fourth group has minimal presence in Lake Victoria and more often than not are present more by accident than by design, they are river and stream dwellers eg. *Barbus amphigramus*.

Finally, as a tool for research, the scientific importance of Lake Victoria is unrivalled both in immensity and quality as it provides scientists and scholars with unequalled opportunities to study, among other disciplines, patterns and processes of evolution.

In my view, adequate measures need to be put in place to curtail the degradation and initiate the restoration of Lake Victoria to its past glory. I would not hesitate to recommend the following steps and measures to help curb the problems.

To decrease pollution, all sewage wastes disposed into the lake must be accorded thorough pre-disposal treatment and only disposed at safe levels. For this to succeed, modern sewage treatment plants should be constructed in all the major urban centres along the lake shores. People living in the rural areas within the lake basin must be encouraged to build and use pit latrines.

All effluents produced by industries, factories and other plants must also be treated before being released. This process should be monitored by the governments who should in turn ensure that the companies involved adhere strictly to the requirements and those that do not meet the specified standards must be reprimanded and punished.

Pollution may also be drastically reduced by the halting of swampland reclamation and clearance since these regions act as buffer zones. In addition riparian zones of the inflow rivers should be left intact to ensure control and put checks on the flow of agricultural fertilisers, fungicides, pesticides, etc., into these rivers and subsequently into the lake itself.

Promotion of commercial fish farming within the lake basin would be an alternative to fishing from the lake and this would alleviate the current overfishing. Governments and other financial institutions should provide an impetus for this through the provision of soft loan facilities to fish farmers and co-operative societies to undertake this proposal. In addition, promotion of captive propagation as well as the establishment of fish nature reserves are other alternative methods that are capable of changing the trend. Aquarium and archival exhibits, if set up, would promote knowledge about the lakes fisheries, thereby helping to create awareness of the problems afflicting the fishing industry.

Fish breeding zones should be protected to reduce the impact of interference on their breeding patterns and ensure species sustainability. These measures, if adequately put in place, would address the problem of over-fishing.

The most pressing problem that needs immediate attention and solution is the water hyacinth menace. In tackling this issue, we have three principle options, i.e.,

employing biological, chemical or mechanical methods. However, all and each one of them have pros and cons as regards the lake's ecology, which is the paramount factor to consider when deciding the method to be employed. Generally it has been found that physical and chemical methods of water hyacinth control are useful only for a short time, since growth is rapid and these methods often have to be repeated. Chemical methods, though useful, can lead to pollution and may affect non target species.

Biological control on the other hand does provide an environmentally friendly, cost effective and permanent reduction of the hyacinth. Host specific agents for biological control of water hyacinth have been found and their establishment in Lake Victoria may be a breakthrough in the control of the weed. These controls include 2 weevil species *Neochetina bruchi* and *Neochetina eichhorniae*, and a moth *Sameodes albiguttalis*. The two weevils have achieved a high level of control in both USA and Sudan where the two species have been established for several years.

Earlier attempts by the Kenya Agricultural Institute to employ these methods seem to have failed, or at least a positive result has not been forthcoming. These efforts were not only piecemeal and disjointed but seemed to have been influenced by publicity excitement rather than by objectiveness. Likewise earlier mechanical methods by a company supposedly awarded tender through the Kenya government also seem to have failed and ceased altogether. Such lukewarm and superficial efforts should be discouraged as they amount to nothing more than waste of resources.

On the positive side, there should be increased education and awareness raising; this should involve all the stakeholders, and more so at the grassroots level, because environmental issues affecting Lake Victoria have become very popular, while many people interested lack specific data and recent information. It is also through education that people can learn, understand and appreciate the magnitude of the problems facing Lake Victoria and their potential impacts. The youth must be massively involved because it is in their hands that the future of this lake belongs; by so doing we are not only building them for the future but also building a future for them.

Environmental impact assessments should be conducted to develop sustainable ways of exploiting the resources of Lake Victoria with the aim of obtaining an acceptable balance between the needs of the environment and the interests of the beneficiaries; this should be in the form of a masterplan, or blueprint, detailing all the documented facts about the potentials and pitfalls of the exploitation of Lake Victoria. It should be constantly updated and reviewed to conform with the changing status of the lake to ensure overall sustainability. The master plan must involve a participatory approach which must integrate and address the views, hopes and fears of all the stakeholders and should be undertaken by experts.

We may never eliminate completely the negative environmental repercussions of development but on the

positive side we can live harmoniously with this ecosystem by putting in measures to curb excessive (ab)use of its resources. We, the peoples of Kenya, Uganda and Tanzania, now, more than ever before, need the courage to act collectively with the realisation that as a common resource, Lake Victoria and its problems do not respect political boundaries and so the solutions must also transcend these boundaries.

It is encouraging to note that much effort has already been put in place to remedy the situation. Awareness is fast approaching its zenith and action is going on at local, regional and international levels, involving the three East African governments, agencies and NGOs, like UNEP, World Bank, KARI and OSINELA, Lake Victoria Wetlands Team, to mention but a few. Of particular importance is the establishment of the Lake Victoria Environmental Management Programme (LVEMP) charged with, among other responsibilities, the task of co-ordinating the involvement of all stakeholders with the eradication of problems affecting Lake Victoria.

As the century comes to an end and a dawn of a new century unfolds, my wish, and the wish of many people, is that these efforts will translate into action that will secure the future of Lake Victoria as a common heritage and resource. The lesson has been learnt; Lake Victoria is actually not the Lake without termination. The task that lies ahead is enormous indeed and it may not be achieved tomorrow, just as the problems did not start yesterday, but like a journey of a thousand miles, it must start with a single step. Should my wish be granted, then perhaps in the coming two decades, when I will grab my pen and paper to scribble columns about the magnificent Lake Victoria, history will accord a chapter, if not two, to the successful restoration of the world's second largest freshwater lake.

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EARTHWATCH

THE MALLORCAN EXPEDITION

My Earthwatch fellowship was to the Spanish Island of Mallorca. This is one of the Balearic Islands, situated in the Mediterranean Sea. The project area was the S'Albufera Natural Park. I received the fellowship through the East Africa Natural History Society, Nairobi, Kenya. As a first time visitor to Europe being given this opportunity to visit one of the world's premier wildlife areas was most certainly a rewarding experience!

As the aircraft approached the island, I looked through the window eager to catch a glimpse of Mallorca. I could see the mountains set on a base of deep blue sea. The sunset hitting the mountaintops was making them more spectacular. It had been some 20 hours since my colleague on this project, Michael, and I had left home. Within just a few minutes we had landed in Palm de Mallorca Airport. The sun was now just setting. By the time the Earthwatch representative, Chris, managed to get us to S'Albufera Natural Park, it was already dark. After dinner we were briefed on the progress of the expedition, as it had started a couple of days prior to our arrival. We had arrived late, due to our visa delays.

We both quickly settled into the programme after our first full day. The theme of the project was "monitoring for biodiversity and environmental changes at S'Albufera Natural Park". The main fields of research were grouped into the following: biological monitoring, biodiversity, human and management impact studies. Our Principal Investigator was Nick Riddiford. We worked in teams with each team split into different study groups. These in turn, were headed by a scientist specialising in their particular field. Each day the field workers were rotated, allowing everyone to participate in all the study areas.

I spent my first few days with Rob Strachan working on mice. On the first morning Rob, one other, and I walked to the research site. Several Longworth traps (specialised small mammal traps) had been set 10 m apart in a grid pattern amongst the grass and reeds. Closed traps usually meant that there was a mouse inside. We only dealt with closed traps. Each trap was opened with great care into a large polythene bag and the subject was then isolated towards the corner of the bag. It was then carefully handled to weigh it and then examined to ascertain age, sex and breeding condition. Then it was released adjacent to the area it had been trapped in. New captures were marked before being released. Each trap was then reset and laid back into its respective position. This process was done repeatedly for a number of days before the traps were then moved to a different site. The trapping results were used to determine which species are present in a particular area.

One evening we went to some caves to look for bats. We captured eight in total. Each bat was identified, weighed and then examined to determine age, sex and breeding condition. After this was done, they were liberated.

We spent some afternoons walking areas of the park identifying wild flowers and seeds. On calm sunny afternoons, we conducted butterfly and dragonfly transects. This involved walking on fixed routes of different habitats, identifying and counting individual species within a five-metre range on all sides. Species, such as the painted lady butterfly *Venessa cardui*, were identified; this is a common migrant throughout Europe from Spain. This exercise was more enjoyable at the sand dunes because it usually ended with a long walk on the sandy coastal beach.

Another area of the research study was moths. This involved the use of an ultra violet light trap being set and left overnight, to trap the moths. In the morning the specimens captured in the trap were identified and recorded on the data sheets, then the specimens were released while new specimens caught were mounted for collection reference. Several beetles were also attracted to these traps.

Early each morning we participated in bird transects, these were led by Nick Riddiford. We walked different set routes and identified birds by sight and by their calls. This was done within 25 metres on all sides of the routes. Small birds such as Moustached, Cetti's, Fan-tailed and other warblers and robins, finches and pipits were identified. Among the birds of prey were the Marsh Harrier and Merlin. In the open waters there were usually the more common waterfowl such as Pochard, Mallard, Coot and Moorhen.

Reed bed vegetation monitoring was an interesting area of research. Most of the landscape of S'Albufera is covered with a thick mass of *phragmites* reeds. These areas are normally wet and muddy. A study of the reed bed vegetation was performed to establish the present status. This involved measuring 15 m transect lines in the reeds which we then divided into 25 cm quadrats at 2 m intervals. The total number of reeds (dead and alive) within the quadrat were recorded. Other plant species occurring within the quadrat were also identified. All this data helped to give a full description of the vegetation cover of a particular area of the park.

Occasionally, Charlie Rugeroni led us on a baseline survey on S'Albufera's endemic fungus, *Psathyrella halophila*. This involved visiting those areas where the fungus occurs and making a simple investigation of its habitat preferences.

One of the more interesting parts of the research was on aquatic invertebrates in relation to water quality. The aim of the study was to monitor water quality within S'Albufera by identifying those communities of species which are useful indicators of water quality. One morning, I joined Michelle's (our specialist scientist) team and it was the most exciting part of my fieldwork. We had to cycle to the sample sites and each of us took a sample from a different wetland. This was done by sweep-netting the water at least 25 times, to ensure that a variety of species was captured. We took the samples to the centre in containers. In the afternoon we worked through our samples identifying them with the use of hand lenses. We then recorded the captured species. Species such as water beetles, stone flies and freshwater shrimps were caught. I enjoyed this study so much that the following day I volunteered for Michelle's team once again but this time cycling further afield to different sites.

A vital part of our expedition was discussing how S'Albufera can be developed as a biodiversity model using already gathered ecological data. This concept was to find a suitable criteria that would best describe the various components of S'Albufera using the detailed data already available. Everyone participated by putting forward ideas on how the model can be developed, with

Chris being the leader. Once the model is completed, it can be used as a guide in other areas that also have a rich biodiversity. The model is an important part of environmental auditing.

Other work done during the expedition was the labelling of flora photographs and grouping species in their respective botanical families, and general entomology with the insect reference collection.

The knowledge gained

Participating in the Earthwatch project was one of the most exciting things that has ever happened to me. I was exposed to an international working environment and through this I feel I have developed a more open mind especially in the world of conservation.

The expedition has had a great impact on my career in the field of environmental studies. I have gained a great deal of knowledge by working with an international research team. It is now very clear to me that multidisciplinary studies of a specific area are very important in the management of natural resources. We need to do extensive and practical research such as the one at S'Albufera in order to fully understand how environmental systems work, so that we can apply the appropriate conservation measures. In Kenya, I am involved with a lot of environmental conservation activities. Already, I am sharing some of this knowledge that I have gained with my colleagues. I hope by doing so, I can make them understand more the meaning of research in relation to environmental conservation. High diversity of species can only be maintained through careful management of their habitats and this is the message that I feel I must convey. I gained knowledge on practical research procedures that are standard, which I can apply whenever I am in the field. Above all I feel more confident to work in field research.

An important part of my work that I greatly enjoy is networking in the field of environment. This is about knowing who does what and sharing experiences with the others on environmental issues. The Mallorcan expedition has made me build international networks with those who have the same interest. During the expedition we shared lots of experiences, achievements, challenges and problems and I also gained some wonderful ideas from these. This meant an exchange of information; the dissemination of knowledge is a wonderful thing.

S'Albufera is an outstanding migration area for birds and as such is a specially protected region for birds. Bird watching out there has made me become a better birder. This is mainly because I feel I have gained incredible knowledge of European species, especially of their habitat preference, migratory patterns, feeding and territorial behaviour. An example of this was: I know why we found such large numbers of the moustached warblers in the reeds. After learning about their behavioural patterns I came to learn these birds are shy and have a tendency to skulk having a preference for frequenting undisturbed habitats where there is tall

vegetation. Also I learnt that S'Albufera de Mallorca is a RAMSAR site (wetland site considered of international importance), something I was unaware of until I researched the area prior to my visit. This is because of the unique wetlands of S'Albufera. The park and the entire island act as refuge for thousands of birds, many of them migrating each year between Europe and Africa. When I am birding in Kenya, the sight of a migrant Reed or Marsh Warbler will definitely excite me just that little bit more because that bird may have come by way of the Balearic Islands and S'Albufera. I am already sharing this exciting knowledge with fellow birders.

As a person who enjoys ecology, I have learnt of how species richness, their distribution and abundance can be used to measure and assess the ecological importance of a particular area. Everything gave fresh impetus to my own interest in nature. I feel a thirst for knowledge in the field of ecology and conservation and I am now ready to absorb and to learn more from nature. That knowledge I have gained through interacting with nature in the most harmonious and gentle way.

Other experiences

Mallorca I found was a fresh and creatively inspiring island. Just being there in another part of the world away from where I was born and have always lived, enjoying natural history (my favourite hobby) was a great experience. I worked with dedicated, enthusiastic true naturalists in the most professional and enjoyable manner. I met Max Nicholson, whose age is close to three figures, possibly the oldest world conservationist. Max was our Advisor.

One morning I woke to the sound of pouring rain. It was only then I remembered that I had volunteered to help Rob with the mice that morning and now it was cold and very wet. Each one of us in the team put on a pair of wellington boots and a raincoat. I had several layers of clothes on under the raincoat as well, just to be sure I was warm enough. We walked down to the site between the wet reeds, in the drizzling rain. We tried to work as fast as possible yet very carefully concentrating more on the newly captured specimens because a great deal of data had already been gathered on re-captures. We found a rat inside one of the traps and took it back to the centre, only later to find out that it was another re-trap. Everyone was excited to see the rat again.

The experience of cycling long distances to the field was also exciting to me because I had never been able to cycle before reaching S'Albufera. Sometimes, we cycled to the beach in the evenings.

S'Albufera Natural Park is a unique freshwater coastal wetland that combines many special features, from freshwater inland marshes to the coastal salt-water marshes. Plant and animal biodiversity is high. As a true naturalist, I often felt the urge to explore the park on my own. There is plenty to see and to listen to. It is a place where you want to wander alone for hours and experience the true feeling of nature. The fact that there

are no dangerous wild animals in S'Albufera made me feel rather more confident about walking around the park without fear. Birding on my own was therefore a most enjoyable experience. It was always quite refreshing to walk or cycle on the clear tracks between the reeds. During my bird walks, I enjoyed the hesitant Cetti's Warbler and its insistent staccato song, the jerky flight of the Fan-tailed Warbler, and the peaceful flight of the Marsh Harrier and the sight of the water birds swimming. All these and more were delights offered by the park.

One morning, I cycled slowly on a long wet and muddy track towards the old farmhouse. There was lots to see from both sides of the track. Each time I saw or heard something interesting, I stopped to enjoy it. I watched the numerous wetlands full of life, Coot, Purple Gallinules, gulls, and many more. Occasionally I heard the wild cry of a Water Rail hiding within the reeds. As I approached the farmhouse, I could feel the warmth from the rising sun on my face. A group of feral pigeons made a sudden noise from the nearby pine trees. Reaching the gate to the farmhouse I put the bicycle down and stood still, watching the awakening nature. There was the soft and delicate colour of the cattle egrets feeding on the insects in the field, lots of small birds feeding on the nearby bushes, a group of gulls flying high in the sky. I stood there for about an hour, in the middle of all these. It was a lovely way to start my day.

One evening, as a group we visited one of the hides overlooking a wetland. We sat there, each one of us with a pair of binoculars enjoying the spectacular views of the water birds. Several Coots were swimming in the water, the Mallards were sitting by the shore. There was a Common Sandpiper picking its way along the shore, several ducks flew in shortly followed by a Grey Heron. It was as if there was a party, with the water providing all the delights required.

Our day off was spent touring other parts of the island. We drove to the coastal mountains, the Formentor Peninsula. The approach to the mountains begins on a long straight road that bypasses the beautiful beaches. Then a winding road starts as the mountains near. When we reached them the air was cool and there was a breeze. We climbed up through the hard limestone, stopping occasionally to identify special plants which grow between the hard limestone rocks. From a viewpoint we watched the pleasant combination of the blue water and the buildings behind the open view of the surrounding hills and cliffs.

From there, we drove to the Lluch Monastery. I was told this is a spiritual heart of Mallorca. The road to the Lluch is even more winding. When we reached there, we quickly settled down to have a picnic. After this we toured the surrounding areas. The Lluch Monastery is in a beautiful setting with its cultivated fields and an interesting looking valley that runs below it. Lots of sheep could be seen grazing, we could hear the bells hanging around their necks. It was interesting to me to see wild goats wandering in the nearby hills. On our way back we had a stop and a short walk, passing through fields of almonds. That was the first time I had

seen almond trees. We stopped again at Pollensa Town and Chris, our guide, took us to have a cup of coffee at a rather fine hotel by the beach. In the evening we crowned it all with an outing for dinner.

Other experiences were cooking together, which gave me a few tips on cooking methods. Now I know how to make some Spanish and English dishes. Going out to assist with shopping was another experience that gave me a chance to see many things and to make comparisons with Kenya. We visited the local market. On our way to the market, we passed large farms with windmills on almost all of them. We spotted hundreds of Yellow Legged Herring Gulls feeding in the fields. When we arrived at the market it was busy, people buying and selling, the stalls full, with a variety of commodities, from fresh produce to household items. We walked around the market. It was different and yet it reminded me of a typical market back home in my small village. But there I was walking on the narrow streets of a typical Mallorcan market, mingling with these local people, trying to bargain and buy using this "strange" (to me) Mallorcan language that I barely knew anything of. It was a different and rather exciting experience.

On my last evening in Mallorca I cycled through the park with my binoculars around my neck. It was quiet with the soft sound of the whispering reeds, the most characteristic plant of the park. I cycled slowly towards the area adjacent to the power station. I watched the sun setting on top of the hills. On the nearest wetland I watched more than a hundred cormorants sitting on the dead branches of the trees. I was thinking that the next day I was going to be on that aircraft, returning home. I felt like rewinding everything back to the beginning, as if this was not enough. No one can ever know just how thankful I am to have taken part in such an experience as this.

All these experiences have left me with a memory filled with the images of the island. Environmentalists say "think globally and act locally". I like the idea, but how could I even begin to think effectively and globally before travelling globally? But now when I think of nature it is not only about the loud ringing voice of the Fish Eagle in Lake Naivasha, or the choruses of the Rock Hyrax at the cliffs close to Lake Baringo. I can also let my mind wander around the Mallorcan Island. I can close my eyes and hear the whispering sound of the reeds in the Parc de S'Albufera, the scolding alarm calls of the Sardinian Warblers from the reeds. Or imagine that I am watching the beautiful colours of the Painted Lady Butterfly flying over the sand dunes or listening to the high pitched voices of the frogs of Mallorca. It is one world and I am most definitely thinking globally now.

Evaluation

First of all, I have to commend Earthwatch for initiating such an inspiring and educational project. The Mallorcan experience was a great thrill and the knowledge I have gained has definitely changed a part of me forever.

During fieldwork, responsibilities were rotated among each team so we had a chance to participate in all the studies. Participation in all the activities exposed each one of us to the different methods and procedures. Simple and cost effective techniques were used while a high quality of data was gathered. It was usually exciting to move from one team to another working with a different scientist each and every day. I feel this is very important because at the end one feels that they have fully participated in the project as a whole.

The members of the scientific team are highly qualified in their specialised fields. Each one of them is a dedicated and hardworking individual but here they work as a team. Beside their specialised knowledge they have a knowledge of the park and its surrounding areas. During field work they took their time to explain things whenever necessary and were always ready to share their knowledge with the volunteers. They showed patience in answering our numerous questions. I will never forget those afternoons when we sat outside with Michelle around a big table, each one of us with a container of invertebrates from various sites. Our heads were fixed over the containers, sorting, identifying and counting those little creatures, most of them so tiny that we had to use hand lenses to identify them. A minute hardly passed before someone consulted Michelle about something that they could not identify even with the checklist in front of them. She never became tired of our questions and this is just an example that showed how the scientists were so dedicated and committed to their work and how patient they were with the volunteers. Also the park staff were very friendly and helpful.

I enjoyed most of the food I tried. I liked the way we shared all the responsibilities; this was done with teamwork. It was always so much fun doing things together.

The park and the surrounding areas were peaceful and quiet and therefore it was more enjoyable doing research with no obstruction. I was told that in the summer, thousands of tourists come to Mallorca from all over the world. During this period, hundreds visit S'Albufera everyday. I therefore prefer the timing of the project because the research is done when there is less pressure on the park and less disturbance.

Briefing before the actual fieldwork by the specialist scientist prepared us for the work involved. Also volunteers were usually given a chance to talk about what they did during the day. Every day after dinner, we shared our daily experiences and consulted with each other. This formed a vital part of the project's evaluation.

What did I not like about the project? It all went too fast! I remember the last Saturday when we all sat outside with a cup of coffee while we volunteers talked about ourselves and what we do in our own country. That was the time I felt that we were really soon to depart from each other's company, we had become friends. I just wished we could start all over again!

Dorice Agol, c/o EANHS, Box 44486, Nairobi, Kenya

BOOK REVIEW

The Rhinoceros in Captivity, by L.C. Rookmaaker, SPB Academic Publishing, The Hague, 1998. 410 pages,

Kees Rookmaaker has been extremely interested in rhinos his entire adult life. This book, a massive compilation of all known rhinos which have been in captivity from Roman times until 1994, would be a life's work for most people, but not for Dr Rookmaaker. He has also produced other tomes which have taken years to compile such as *The Zoological Exploration of Southern Africa 1650-1790* (A.A. Balkema, Rotterdam, 1989) and the only reasonably complete bibliography on the rhino entitled appropriately *Bibliography of the Rhinoceros* (A.A. Balkema, Rotterdam, 1983). Presently, Dr Rookmaaker is the Curator of The Rhino Museum in Vaalwater in South Africa. Some of his time is now being spent putting together in the museum the largest collection of articles, books and offprints on the five species of rhinos, over 5,000 items.

The Rhinoceros in Captivity is divided into ten chapters with the bulk of the text devoted to references of the five extant rhino species in captivity: the Indian, Javan, Sumatran, black and white. The author has been able to list 2,439 rhinos in captivity, from only 22 for the Javan to 1,105 for the white, despite the fact that the first specimen of a white rhino only arrived at a zoo as late as 1946 (p.245).

This book is not just made up of a list of rhinos in various zoos, safari parks and circuses. There is a large amount of descriptive text giving details of some of the individual animals. One of the more fascinating themes which runs through the volume is the importance of wild animal dealers; they were mostly Europeans who went to Africa and Asia to catch the animals. An interesting book could be written about these men, some well known and others obscure individuals. Perhaps Dr Rookmaaker could consider such a proposal for future work.

Obviously, with such an ambitious project to list every single rhino ever caught over 20 centuries there will be omissions. Dr Rookmaaker admits he has not found all the references (p.4). The most conspicuous oversight for Kenya has been the lack of any mention of Ol Jogi Ranch which has 16 black and three white rhinos. In a larger geographical context there is a shortage of data for rhinos in Russia; this is probably due to the fact that the author has spent little time in Russia and the zoo authorities there failed to communicate adequately with him.

I would like to disagree with Dr Rookmaaker on one point. He says on page 155 that "the black rhino is not easily tamed like the other species". However, wild black rhinos can be tamed in only a few days, unlike white rhinos which take longer. I remember visiting some white rhinos enclosed in bomas in Kruger National Park which had not become tame after one month in captivity.

For a reference book, the 166 black and white illustrations are generally outstanding and well printed with some published for the first time. However, there is not a credit for any photograph, which I find mildly irritating.

Dr Rookmaaker writes in the introduction: "Of course, this book will fall far short of your (and my) expectations" (p.4). I strongly disagree. I find the book a gold mine of fascinating and relevant information on all five species of the rhino. It is clearly written, skillfully organized, profusely illustrated and well printed. Anybody interested in rhinos must obtain a copy of this book. Unfortunately, it is expensive (over US\$ 100), but the book is well worth it.

Esmond Martin, P.O. Box 15510 Mbagathi, Nairobi Kenya

REQUEST FOR INFORMATION

18 May 1999

Dear Madam,

The Greyheaded Parrot in East Africa: a plea for sighting records

I am a student at the University of Natal, Pietermaritzburg, South Africa, and am conducting a Masters project on the "Conservation Status and Biology of the Greyheaded Parrot *Poicephalus fuscicollis suahelicus* Reichenow in Southern Africa". Part of my study involves recording the historic and present distribution of the species in the wild. In doing so I am referring to museum collections worldwide, atlas data records and reports of ornithologists through the range of the species. The input of ornithologists in East Africa would be most valuable in this study. Please find attached an article for consideration in your quarterly Bulletin.

Please feel free to contact me either via e-mail or post, should you wish to know more about my project.

Yours sincerely

Craig Symes

Cape Parrot and Greyheaded Parrot (Brown-necked Parrot): valid separate species

In 1992 a study of the nominate race of the Cape Parrot *Poicephalus robustus robustus* (Gmelin) was initiated by the late Olaf Wirminghaus. This forest-specific species is confined to the afro-montane forests of eastern South Africa and this long term study is continuing under the supervision of Dr Colleen Downs (wife of

the late Olaf Wirminghaus) and Prof. Mike Perrin (W.P.T. Africa; R.C.A.P.C.). In that study the taxonomic status of this species was reviewed using morphometric analyses, plumage colouration, habitat requirements and distribution, and two separate species were proposed; *P. robustus*, the smaller of the three confined to the fragmented afro-montane forests of South Africa, *P. fuscicollis suahelicus*, with a wider distribution inhabiting woodland, and *P. fuscicollis fuscicollis*, similar to *P. f. suahelicus* in appearance, yet discontinuous in distribution and inhabiting a reduced range of woodland and forest in West Africa (Wirminghaus & Perrin, 1994; Wirminghaus *et al.*, in prep.). These findings support the proposal of Clancey (1997).

The Greyheaded Parrot *Poicephalus fuscicollis suahelicus*, is found from the Northern Province of South Africa south of the Limpopo River, north through Zimbabwe, Mozambique, the Caprivi of Namibia, eastern Angola, Zambia, to northern Tanzania, Burundi, Rwanda and southern Zaire (Fry, Keith & Urban, 1988; Forshaw 1989; Wirminghaus *et al.*, in prep). In East Africa it is an uncommon resident of woodlands being patchily distributed in some regions (Forshaw, 1989) and in the highlands of eastern Zaire (now DRC) it occurs in montane forest up to 3750 m.a.s.l. (Chapin, 1939; Britton, 1980; Forshaw, 1989). In Zambia, where it is widely distributed (48% of Atlas squares) (Aspinwall, pers. comm.) it is nowhere common (Leonard, pers. comm.). In Malawi and Zambia it is generally uncommon in woodlands up to about 2000 m.a.s.l. where woodland tree species provide seeds for food and hole cavities for nesting (Fry *et al.*, 1988). Zambia is reported as one of its strongholds and seasonal movements are recorded (Aspinwall, pers. comm.). These movements are noted as being more nomadic than other *Poicephalus* species (Forshaw, 1989). In Zimbabwe it is widespread, yet uncommon, in woodlands along major river courses and scarce above 1000 m.a.s.l.

The Cape Parrot *Poicephalus robustus* is regarded as vulnerable in the *Red Data Book—Birds* (Brooke, 1984). Fewer than 1000 are estimated to survive in the wild today, hence making it highly endangered (Downs & Symes, 1998). Population declines have resulted through capture for the wild bird trade and aviculture, shooting as pests and destruction of habitat from agriculture and expanding human populations. As a result recommendations have been made for its conservation (Downs & Symes, *op. cit.*). Similar factors may result in population declines of the Greyheaded Parrot. Presently its conservation status is undetermined and very little is known of the biology of the Greyheaded Parrot in the wild. Although widely distributed, it faces similar threats as other parrots worldwide. The IUCN/CITES Significant Trade Review records a significantly high trade in *P. robustus* from 1991–1995. It is therefore proposed, under the auspices of the RCAPC that a study concerning the status, biology and conservation of this species in the wild be conducted.

As part of the study of this species I am investigating

the historical and present distribution of the species in the wild. Sighting records (grid reference for greatest accuracy) of this species, together with Atlas and museum specimen data will assist in creating an understanding of past and present distribution ranges of the species.

A form for entering records can be obtained directly from the author or from the Ornithology Dept., National Museums of Kenya, Nairobi, Kenya. I look forward to hearing from interested parties. If anyone is interested in corresponding with me please feel free to do so.

Craig Symes, Research Centre for African Parrot Conservation, School of Botany and Zoology, University of Natal, Private Bag X01, Scottsville 3209, South Africa. School Office: Tel: (0331) 260 5104, E-mail: symes@zoology.udp.ac.za

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NETWORKING

The EANHS and its sister organisations in East Africa are a force for conservation in the region. One of these organisations is the Albertine Rift Conservation Society (ARCOS). They have been active in promoting conservation and biodiversity research in the Albertine Rift for some time and have struggled on in spite of the many problems and disruptions in the area. The following is a press statement issued after a recent

workshop of parties interested in the conservation of the biodiversity within Albertine Rift.

ALBERTINE RIFT CONSERVATION SOCIETY/ARCOS: PROMOTING COMMUNITY-BASED CONSERVATION AND REGIONAL INFORMATION EXCHANGE IN SUPPORT OF ALBERTINE RIFT MONTANE FORESTS

Regional Priority-Setting Workshop, Kampala, Uganda 13-15 July 1999

PRESS RELEASE

Context

From 13th to 15th July 1999, a regional priority-setting workshop on "Promoting Community-based Conservation and Regional Information Exchange in Support of the Albertine Rift Montane Forests" was held at the Economic Policy Research Centre, Makerere University, Kampala, Uganda. The workshop was facilitated by the Albertine Rift Conservation Society (ARCOS) in collaboration with the Uganda Wildlife Society and NatureUganda.

The Albertine Rift is the western branch of the Rift Valley, crossing along 1500 km from western Uganda, eastern Democratic Republic of Congo (D.R.C.), Rwanda, Burundi, western Tanzania to northern Zambia. This region is recognised to be important in terms of biodiversity due mainly to a high proportion of endemic plants and animals, most of them located in patchy remaining montane forest blocks. These montane forests provide various services ranging from watershed protection, climatic regulations to various services to local people. However, the Albertine Rift montane forests are under increasing threat resulting mainly from an expansion of human demands upon new land and resources from these forests, but also by the lack of effective conservation measures. Many previous or planned conservation initiatives are currently inhibited or not operational due to political instability in various areas.

The Albertine Rift Conservation Society (ARCOS) was founded in 1995 with the mission to promote information and experience exchange, enhance public awareness and conservation, and sustainable use of natural resources in the Albertine Rift region. ARCOS believes that the key for the conservation of natural resources is to support local communities and to allow organisations and groups working on similar issues to contact each other and discuss strategies to improve their actions. One area that ARCOS has attached particular attention is the Albertine Rift montane forests.

Specific objectives of the workshop

The objectives of the workshop were the following:

- To assess existing initiatives and to agree on common priority needs in terms of biodiversity conservation in support of Albertine Rift montane forests in the region;
- To promote linkages and collaboration between NGOs and governmental institutions throughout the region, in support of local initiatives on the conservation and sustainable use of Albertine Rift montane forests;
- To set up a mechanism for improved exchange and collaboration in the joint implementation of conservation activities, joint fundraising for small grants to support community-based initiatives and micro-projects.

Participants

The workshop involved representatives of key conservation institutions (NGOs, governments, universities, Wildlife Clubs) from each country of the region and regional and international organisations operating in the region. It was attended by over 40 participants including one delegate from Burundi, eight delegates from Democratic Republic Congo, three delegates from Rwanda, one delegate from Tanzania, 20 delegates from Uganda, and eight delegates from regional and international organisations with interests in the Albertine Rift. Every participant presented a paper to share experiences with others, as this was one of the objectives of the workshop.

Guests of Honour:

Hon. Baguma Isoke, Minister of State for Lands, Water and Environment, who was the Guest of Honour, opened the workshop. He emphasised the importance of cross-border co-operation in biodiversity conservation and welcomed the regional initiative promoted by ARCOS. Other guests at the opening of the workshop included Mr. Mafa Chepata, FAO Representative in Uganda, Engineer Charles Drazu from The Royal Dutch Embassy in Kampala and Mr. Isaac Kapalaga from Grants Management Unit of Action Programme for Environment, USAID.

Workshop conclusions and recommendations

The Workshop reviewed current regional and international initiatives as well as national initiatives including specific selected site based conservation case studies. It also carried out an analysis of the current conservation status of the Albertine Rift montane forests; identification of problems, constraints, opportunities and threats; identification of potential responses and actions; identification and prioritisation of proposed follow up actions; and formulation and adoption of final recommendations.

The workshop also established a reporting and follow up mechanism which includes preparation of a report on the status of conservation initiatives, priority needs and priority actions for montane forest conservation in the Albertine Rift; and dissemination to a wide range of users in the region and outside the region through the ARCOS Regional Newsletter ('Backbone'), and development of activities to support the mechanism established and community-based initiatives in the region respectively.

The following issues were identified by the workshop as major issues affecting conservation of Albertine Rift montane forests:

- Limited knowledge on the status of the Albertine Rift montane forests
- Need to promote regional networking, information sharing and awareness raising
- Need to promote capacity building and training
- Need to integrate the Albertine Rift montane forests in national policies, planning and strategies
- Need for effective funding and fundraising mechanism
- Need to integrate local communities in the Albertine Rift montane forest conservation
- Need to improve sustainable management of the Albertine Rift montane forests (site and system level)

Finally, the workshop developed a number of recommendations, some of them reported below:

- The workshop recommended that appropriate monitoring programmes be developed, that additional information to fill gaps be collected to achieve proper understanding of the Albertine Rift montane forests, and information on the biodiversity, conservation and management status of the Albertine Rift montane forests be made available.
- The workshop strongly recommended that ARCOS be a vehicle for information acquisition, exchange between countries and within the region and outside the region, and that an information officer be appointed.
- The workshop recommended that a regional information centre be established by ARCOS to serve for all stakeholders in the region and cover both training and networking.
- The workshop strongly recommended that ARCOS should provide regional co-ordination for the preparation and submission of rational and regional funding proposals to funding agencies, and that a fund-raising officer should be appointed by ARCOS.
- The workshop encouraged governments and/or NGOs and donors to explore appropriate actions to ensure minimum maintenance of biodiversity conservation and protection in the Albertine Rift, particularly in critical hotspot areas and those affected by conflicts.
- The workshop recommended that experiences and lessons learned in community involvement in the region be reviewed and provided to those involved in community participation.
- The workshop recommended that specific actions

be taken by governments and relevant authorities to protect critical sites in the region currently threatened, such as Itombwe forest in the D.R.C.

- The workshop recommended that a bi-annual regional forum and annual meetings of focal groups to review progress be organised regularly.

Funding

WWF/World Bank Alliance for Forest Conservation and Sustainable Use

FAO (TCDC/TCCT Experts Programme)

Tropical Rainforest Programme of the Netherlands Committee for IUCN

The Royal Society for the Protection of Birds, and The Polden-Puckham Charitable Foundation.

The workshop summary will be available soon and the final report in 2 months.

For further information, please contact ARCOS at the following address: c/o WCMC, 219 Huntingdon Road, Cambridge, CB3 0DL, UK. Tel: +44 (0) 1223 277314, Fax: +44 (0) 1223 277136, E-mail: samk@wcmc.org.uk Web Site: <http://www.wcmc.org.uk>

c/o NatureUganda, Makerere University, Zoology Dept, P.O. Box 7062 Kampala Uganda, Tel: +256 41 540 719, Fax: +256 41 533 528/530134, E-mail: eanhs@imul.com.

ANNUAL GENERAL MEETING

The 89th Annual General Meeting of the Society took place on 10th May, 1999. This was a very special meeting, being that it marked the 90th year of the existence of the East Africa Natural History Society, the oldest scientific society in Africa. In March, on the anniversary of its founding, the Society's 90th birthday party was celebrated in the Museum with various members relating what the Society has meant to them, discussing the past and looking to the future. Later there was a birthday cake, dancing and a generally good time for all.

EANHS CHAIRMAN'S REPORT, 10 MAY 1999

Ladies and Gentlemen

I am very pleased to welcome you to the Society's 89th Annual General Meeting. The task of making this annual report does not become any easier from year to year. This is not by any means because the Society is languishing, but because there is so much activity, in which so many people are involved, that it is next to

impossible to cut down this report to a sensible size without leaving out some essential nut or bolt. For those nuts and bolts that I fail to mention, either intentionally or through absent-mindedness (a state which a number of years as Chairman has done nothing to alleviate, and possibly something to intensify) I beg your indulgence.

Let me start with the big picture and gradually zoom in. This is our 89th AGM but our 90th year. Our first meeting was held on 25 March 1909. An absolutely perfect excuse for a celebration; and what I gather was an excellent party was held on the anniversary evening. This may well have been one of the largest get-togethers of the last 90 years, as more than 150 members were present. A splendid turn-out and I hope a sign of things to come.

Turning 90 is, I imagine – I have no personal experience yet – a good time for reflection and taking stock. My report last year spoke a lot about change. This year perhaps the theme is more to do with consolidation. Your Executive has taken the mandate we received at last year's AGM, and the lists of tasks still remaining from our planning workshop, and done its best to make things work. Finally, we have a proper strategic plan for the Society. It has taken a year and a half to produce it, so the plan now extends for four years rather than five; but it will act as a guide for all our activities from now on. The delay has had some advantages, in that much of the foundation for progress has already been laid. Thus we can indeed start to consolidate rather than just change things. The plan is available for reference in the Nature Kenya office; any member who is interested can obtain a personal copy, subject to a small charge to cover photocopying.

The name 'Nature Kenya' now seems well established (much to my own relief, as I have never been able to say 'East Africa Natural History Society' intelligibly over the telephone). With pleasing symmetry our Ugandan branch is now calling itself 'Nature Uganda' (though they have the italicisation reversed, presumably as a subtle affirmation of independence). We printed a new membership brochure last year, rather radically using FULL COLOUR, and showing off the new name. More on that later.

The third main item that came up at the last meeting was the formation of a limited company. For various technical legal reasons, this is not looking to be such a good idea as it seemed then. Your Executive is still deciding how to handle the issue, and taking additional advice, and may bring back a recommendation to the next AGM.

Time now to apply the zoom. In terms of activities, there has been lots going on. The Arboretum Master Plan is still not formally approved by the Forest Department, which is very frustrating, but if this has in any way dampened the enthusiasm of FONA one would be hard pushed to tell. As well as the regular monthly tree walks, they have held a Solar Energy Day, a Holiday Nature Day for school children, a Christmas Carol sing-along and of course Wind in the Trees – now established and looked forward to as an annual event. Those not involved may not realise JUST how

much legwork goes into the organising of any these events—just one a year would be sufficient to exhaust most voluntary groups, so well done FONA.

Succulenta continues to be the group that puts the fight in 'xerophyte'. A busy year has seen a number of intriguing succulent activities, including a visit to an Industrial Area sisal factory! The group has also been closely involved in establishing the living collection of succulents in the new Botanic Garden at the Museum. I drive past these plants every morning and they seem to be doing well — this should certainly be an enduring achievement for the group.

In the last few months, the Mammals Committee has been showing distinct signs of coming out of hibernation, yawning and stretching and thinking about what to do next. We await developments. The Bird Committee has met regularly and kept itself busy with various ornithological matters, including setting up a small grants scheme, but has had no public events this year.

The Kipepeo Project made us all very proud by winning the 1998 Dubai Award for Best Practices in Improving the Living Environment. What this means in plain terms is that the project's innovative approach to conservation through butterfly farming is regarded internationally as a model. Congratulations to the Kipepeo staff and in particular to Dr Ian Gordon. Kipepeo has now come to maturity and needs a more solid institutional base. Nature Kenya is presently in the process of arranging a handover to the National Museums.

The general members' programme this year has been remarkably varied. There have been outings all over the country to Olorgesailie, Amboseli, Masai Mara and Marish Pass among other places. Talks and lectures have covered subjects as diverse as integrated pest management, human origins, sacred forests and alien ducks. I am interested to see that this year we seem to be pioneering the lideo, or lecture video, where a speaker introduces and takes questions after the film. This seems to keep everyone happy — so far, so good.

Our work on the Important Bird Areas programme has really taken off this year. As most of you will know this is underpinned by GEF funding for the project 'NGO-Government Partnerships for Sustainable Biodiversity Conservation' (a title that trips almost as neatly off the tongue as 'East Africa Natural History Society'). Although focused on IBAs, this work allows us to tackle a large chunk of the conservation activities in our strategic plan. We have made substantial advances at both the national and local levels. Nationally, an IBA-National Liaison Committee (on which 20 institutions are represented) is up and running, and has held five meetings. With the help of the NLC, we have also published, and started to distribute, an attractive IBA poster. At the same time, Nature Kenya is taking an active part in a number of key committees and fora. Almost all of these also have impossible names, ranging from the Inter-Ministerial Committee on Environment Biodiversity Sub-committee to the Mt. Elgon Integrated Conservation and Development Project Steering

Committee. Although it is often an uphill struggle, the Society's views are being listened to and taken seriously, and this gives us a real chance to exert a positive influence for conservation.

The other side of the coin is the development and support of IBA site-support groups. At least half a dozen of these are now active at various sites, with more springing up all the time. Two, in Kakamega and Kinangop, have already secured some funding (from the African Bird Club and RSPB) for carrying out conservation education work with schools. The process of helping these groups to develop is fraught with hazards and pitfalls, but we are all learning fast and I think making considerable headway. As the project 'Tripartite-Review' for last year put it: 'With encouragement, support and some input of resources, local groups can potentially make a real difference for biodiversity conservation. However, the local community's needs must be addressed — conservation cannot be tackled in the abstract.'

The conservation prospects in Kenya in particular have remained gloomy this last year, and in the present state of Governmental inertia it is very difficult to make headway. The most pessimistic view sees the country steaming inexorably towards biodiversity disaster, and organisations like ours busy rearranging the deck-chairs, as if it mattered. I think our work does matter; does make a difference; and the Society's investment in linkages and awareness-raising, both nationally and locally, will really pay dividends in the long run.

From a detached point of view, one of the most interesting aspects of the GEF project so far has been wrestling with the United Nations bureaucracy. The most positive thing one can say about this is that it has been a real learning experience. We have not given up hope of receiving our set of desk-top publishing equipment, which was first ordered more than a year ago. On the other hand, to everyone's amazement, we *did* recently take possession of the project Landrover. Unfortunately the UN procurement agency had somehow managed to order the wrong model, but who's quibbling?

Society publications have seen some progress, albeit patchy and slow. The one and only Society publication ever that has always appeared on time, every time, has now ceased to appear at all. I refer of course to *Ballya*. Its Editor, Professor Len Newton, has kept it going more or less single-handed since its inception, and finally felt that the publication was evolving too rapidly into *Newtonia*. The 1998 volume will therefore be the last, at least in its established format. Congratulations to Len for his efforts; I am told that full sets of this excellent and well-regarded journal will be bound for sale in due course.

After continued disappointments with local printers, the *Journal* has migrated to Belgium. Through an agreement between the Society, the National Museums, and the Royal Museum for Central Africa in Tervuren, the *Journal* will be produced and distributed overseas. The first volume under the new arrangement has just appeared, and I think represents a vast improvement in production quality. On the other hand, we are still two

REPORT OF INCOME AND EXPENDITURE FOR THE YEAR ENDING 31 DECEMBER, 1998

The following is a copy of the Income and Expenditure Account for the year ending 31 December, 1998, prepared by J.T. Birnie and presented at the 1999 AGM.

INCOME	
Members subscriptions	36 8812
Donations	11 673
Interest	236 071
Sundry income	5 620
Surplus on office sales	111 109
Sales of journals and bulletins	48 012
Society Income	781 297
 EXPENDITURE	
MEMBERS SERVICES	
Newsletters, brochures & postage	374 625
Bulletin	26 495
Journal	401 120
 ADMINISTRATION	
Bank charges	31 216
Insurance	33 319
Telephone, fax & e-mail	55 161
Repairs and maintenance	443 326
Salaries and staff costs	1 082 407
Training and seminars	90 981
Travel and support	72 413
Stationery	183 901
Storage	41 416
General office expenses	150 955
Accountancy services	180 000
BirdLife International	28 400
Depreciation of fixed assets	107 304
	2 500 799
 Less Contributions	
Royal Society for Protection of Birds	1 622 658
GEF/UNDP	1 214 544
Tropical Biological Association	14 345
African Bird Club	72 902
Earthwatch	95 140
General recoupment of overheads	375 965
	3 395 554
 SURPLUS FOR THE YEAR	 1 274 932

years behind schedule (this should be seen in perspective—it is only 2.2% of our Society's age). Additional issues are in hand, fortunately, and there should be rapid catching-up from this point on. Thanks to the Editorial

Board for all their hard work to secure the Tervuren arrangements, and to bring the journal back on schedule.

The Bulletin is also catching up, indeed a little faster. The last issues for last year have just gone to press. We

are now printing in Mombasa, rather than Nairobi. Contrary to most people's impression of coastal business practices, this is costing the Society half as much, taking half as long, and looking twice as good as the previous printers could manage.

As for Kenya Birds and Scopus—I can only quote the philosopher Wittgenstein, in that 'whereof one cannot speak, thereof one must remain silent'. They will, no doubt, appear very soon.

Time to turn to people. Our rate of acquiring new staff has slowed, but not stopped. The latest to join the team are William Olang*, as driver/messenger, and Stephen Wamiti, as field facilitator to the RSPB Kinangop project. Why does the Society need a driver when it has no vehicle, you may ask? Well, there are in fact good reasons—even before the United Nations Operational Services sorts out our Landrover. We also welcome David Mutekanga, from Uganda, as the GEF project Sub-regional Co-ordinator. He is employed directly by BirdLife International, but will be operating out of our office here to bring together BirdLife Partners in the East African sub-region.

As always, we have relied this year on numerous volunteers, without whom the Society's wheels would quickly grind to a halt. I cannot list them all, but would like to say particular thanks (in no special order) to Narinder Heyer, Githinji Kamau, Mercy Njeri, Dorice Agol, Shailesh Patel, Elly Gathungu, Anne Nyambura, Louise Fordyce and Martin Hintridge. Our expanded activities mean that volunteer input is even more vital than in past years, and we are most grateful to those who generously give their time to help the Society out.

The Executive Committee, all volunteers too, cannot be forgotten here. I would like to thank all of them for their hard work and support. It is not invidious to single out John Silvester, who bows out of the Committee this year, for his work on our Constitution and other legal and management matters. This has been a tremendous input for which I am personally very grateful. Perhaps this is also an appropriate point to congratulate our former Vice-Chairman, Dr George Abungu, on his appointment as Director-General of the National Museums of Kenya. Although George has consequently had to step down as Vice-Chairman, this can only strengthen the close and constructive ties between our two organisations.

As a final point, I would like to revisit the issue of membership. You will hear shortly an account of our finances (see p. 30). They are certainly healthy enough, but the figures conceal a serious long-term problem, as for some time now, membership subscriptions do not come close to covering the actual costs of membership services. There are two (perhaps incompatible) approaches to this problem: to raise subscription charges, or to increase the number of members. Before anyone becomes too agitated, let me reassure you that your Executive has firmly plumped for the latter strategy, at least for the time being. With our new name and new brochure, and an excellent membership package, we should be making great strides in membership recruitment. Unfortunately, our present strides are not

as long as we should like. Membership is rising steadily, but we need six or seven times as many new members coming in if we are to have some hope of breaking even over the long term. If you can do nothing else to support your Society this year, **please** try to recruit at least one additional member. It isn't all that hard to do.

Thank you,

Leon Bennun, Chairman

EAHNS MEMBERSHIP RATES PER ANNUM

	Local	US\$	UK
Life	now closed to further subscription		
Corporate	5000	200	135
Sponsor	1000	56	40
Institutional*	700	36	24
Full	500	26	20
Family	700	30	20
Pensioner	250	-	-
Student**	250	15	10
Conservation			
Group Member***	100		

*Schools, Libraries and Conservation groups.

**Only children under 18 and full-time University undergraduates. Graduate students register as full members.

***Only open to individuals who are members of an Institutional Member which is also a Conservation Group approved by the Executive Committee.

Membership offers you free entry to the National Museums; free lectures, videos, films or slide shows every month in Nairobi; field trips and camps led by experienced naturalists; free use of the joint Society-National Museum Library (postal borrowing is possible) and the monthly newsletter and twice yearly Bulletin. The Society is the BirdLife Partner for Kenya. It organises the ringing of birds in eastern Africa and welcomes new ringers. It also runs an active Nest Record Scheme.

Subscriptions are due on 1 January. From 1 July you may join for half the yearly subscription and receive publications from that date. Application forms may be obtained from the Hon. Secretary, Box 44486, Nairobi, Kenya.

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The *EANHS Bulletin* is a printed magazine issued three times a year, which exists for the rapid publication of short notes, articles, letters, and reviews. Contributions may be in clear handwriting, printed or on disk. Black and white photographs and line drawings are most welcome. E-mail attached files or short texts in e-mail messages are most welcome. Please send to the Editor (EANHS) Box 10018 Bamburi post Office, Mombasa Kenya

E-mail: LADepew@africaonline.co.ke

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Scopus is the publication of the Bird Committee of the EANHS. It is published two times per year. All correspondence should be sent to D.A. Turner, Box 48019, Nairobi, Kenya.

Kenya Birds is a publication of the Bird Committee in conjunction with the Ornithology Dept, NMK. It is published two times per year and contains popular and informative articles on birds and birding in Kenya. Correspondence should be sent to Dr Leon Bennun, Box 44486, Nairobi, Kenya.

